

to tell their side of the story to the public effectively and without loss of dignity, through buying space in national magazines and in the daily papers. Now the railroad executives have decided to undertake a national advertising campaign with the double purpose, first, of informing the public of the facts regarding the situation at the time the railroads are about to be returned to their owners, and second, of keeping the general public informed of what railroad managements are doing, what their problems are and of the progress being made in the solution of these problems. The millennium is not going to arrive in railroad affairs on the day the private corporations resume operation. Every shipper is not going to have his freight moved promptly and safely whether it is correctly marked or not. Every traveler is not going to encounter a courteous ticket agent, baggage man, brakeman and conductor. The best that can be hoped, is for the immediate inauguration of a drive to improve the railroad service and lift it from the sad estate into which it has fallen under war conditions and during the last year of confusion under government operation. It is eminently fitting and should be mutually helpful for the railroad executives to lay before the public the progress being made in carrying out this undertaking, and it is both fitting and just that investors should have the fullest information in regard to the properties in which they are vitally interested. The following resolutions have been introduced in Congress to investigate the advertising campaign of the railroads and also the propaganda campaign of the Plumb Plan League. There has been no secrecy about the fact that the railways are preparing to spend about a million dollars in their advertising campaign and that the advertising is to run some weeks and is to appear in daily, weekly, agricultural, trade and labor papers throughout the country. The amount it is planned to spend is not large relatively to the size of the railroad industry, the importance of the railroad problem and the number of people it is necessary to reach.

Why Speed Is Imperative in Dealing With the Railroad Problem

THE GOVERNMENT ought not to relinquish control of the railroads or to terminate the guarantees of standard return without permanent legislation insuring the companies that they will be given rates which will not only maintain their solvency but also enable them to raise the vast amounts of new capital they need. The railroads ought not to be returned to private operation at all without at least temporary legislation continuing the guarantees of standard return until permanent legislation has been enacted.

While these things are plain to those who know the existing railroad situation, the additional and almost equally important fact should not be overlooked that the welfare of the country demands that permanent legislation shall be passed and the railroads returned to private control as soon as possible. The facilities of the railways are today far more inadequate to the present and prospective demands of commerce than they ever were before. There is good reason for believing that the demands on them will increase during the coming year and will be larger in the late summer, fall and winter of 1920 than ever before. Therefore, a large expenditure for additions and improvements should be made in 1920. But until permanent legislation is passed the railway companies cannot begin raising funds for this work; they cannot begin making preparations for it until they know the exact date on which the properties will be returned to them; and they cannot actually begin the work until the properties are back in their hands. There is now talk of delaying the return of the railways to April 1. If it were definitely announced that they were not going to be returned

until then Congress probably would defer passing permanent legislation until almost that date. The result would be to render it impossible to carry out a program of improvements which would be of any help in handling business in 1920.

The budgets providing for needed work can be made up in a short time. Many companies already have them practically made up for the next year. But after the budgets are made up the new capital for whose investment they provide must be raised. Most of the companies will not be able to raise any new capital until permanent legislation is passed.

Improvements and additions are of two kinds, those to permanent structures, such as tracks, yards and buildings, and those to locomotives and cars. After the money for additions to, and improvements in, permanent structures is raised the orders for materials must be placed. This involves negotiations of more or less length with the railway supply companies. Then the materials and supplies must be made by the manufacturers before they can be delivered to the railway. Meantime the railway companies must be getting ready the organizations, including large numbers of employees, that are to do the work for them after the materials have been received. Under present conditions in the iron and steel and other industries the delivery of materials will be slow and labor will be difficult to get. Unless the railway companies are able to begin placing orders for materials and getting ready their organizations within a few months, it will be impossible for them to do in 1920 any considerable amount of additions and betterments work which will help them to handle the traffic of 1920.

The same reasoning applies with equal force to the obtaining of new equipment. In January, 1918, immediately after government control was adopted, the *Railway Age* began urging the Railroad Administration to place at once whatever orders it was going to place for locomotives and cars upon the ground that if it did not place them at once it would not get the equipment in time to be of any service to it in the year 1918. Instead, the Railroad Administration entered upon a policy of wholesale standardization, and the orders for equipment were not placed for some months. When they were placed it was optimistically announced by some officials of the Railroad Administration that most of the equipment ordered would be delivered and ready for service by fall. The *Railway Age* said it would not be, because it could not be. Our prediction proved only too correct. Not all of the 100,000 freight cars ordered in 1918 have been delivered yet, and only a small part of the new locomotives and cars were ready for service in the fall of 1918. The course of events will be similar in 1920 unless the railway companies are put in a position where they can place their orders for equipment very early in the year. It takes time to design equipment, to make the contracts for it, and especially for the builders to get materials and labor and to do the actual work of building.

If the return of the railways to their owners is to be postponed beyond January 1 the program which should be adopted seems obvious. First, the date on which they are to be returned should be finally and irrevocably settled, and it should not be later than March 1. Then Congress should work unremittingly on permanent railroad legislation and pass it not later than February 1. The railway companies will then know pretty early in the year just what kind of regulation they are going to have. They will be able to begin placing orders and to perfect their organizations for the work which is to be done after the properties are returned. The properties ought to be returned not later than March 1, because improvement work should be begun throughout the country in March.

If Congress and the administration fail to pass legislation by February 1 or to return the railroads to their owners by

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If Congress and the administration fail to pass legislation by February 1 or to return the railroads to their owners by

March 1 they will assume a serious responsibility for the effects which their delays will produce upon the ability of the railroads to handle the commerce of the country when it again reaches its peak in the latter part of 1920.

The Storage of Railway Fuel

THE RECENTLY SETTLED STRIKE of bituminous coal miners and the acute stage of fuel which has resulted in many sections of the country brings forcibly before the public the urgent need of stabilizing the soft coal mining industry. As indicated by the demands of the miners, one of the most serious causes of discontent is the lack of steady employment which, while the wages appear to be adequate on a daily basis, results in the aggregate earnings of the men in this industry being too small to provide a satisfactory living when distributed over the many periods of unemployment.

In a statement issued by Eugene McAuliffe on October 1, the difficulties surrounding the industry are divided into three classes as follows: First, a measure of mine development in excess of that required if it were reasonably employed, this excess development working short time during the summer, thereby materially increasing the cost of production, with the recurring opening during the winter season of mines producing low grade coal, employing transitory and unskilled labor; second, a season of idleness on the part of mine labor, which is being used as the basis of a demand for a six-hour working day and wage increases approximating one hundred per cent; third, the difficult task set the railroads to provide sufficient coal cars to move the winter's coal supply from August to December, inclusive, with material increase in the cost to the consumer necessary to recover the losses sustained by the producer during the idle summer period, plus the premiums that invariably follow a heavy demand, however made, for any commodity.

The remedying of these conditions is a national problem in which no section of the public is not interested. Aside from the mines themselves, however, probably no industry is more directly affected than the railroads and the benefit to them of any measure of stabilization which may be effected are ample justification for the taking of special measures on their part to that end. At least two such measures have been proposed: The publication of seasonal coal freight rates and the storage of the railway fuel supply during the spring and summer months. Among the benefits of storing coal for the railroads are the transfer from the period of heavy traffic movement during the fall and early winter months, of the movement of a large portion of the railway fuel supply to the spring and summer months, when the traffic movement is at its lowest ebb; the insurance of an adequate fuel supply for the transportation needs of the country during possible fuel shortages due to strikes or extraordinary winter weather conditions, and the possibilities of some advantages in price as well as in the quality of the coal received. These advantages in a measure are off-set by the necessity for providing proper storage facilities, the cost of the extra handling involved and the deterioration in the quality of the fuel resulting from storing and handling. With efficient care in the provision of storage facilities, however, the latter objection may be reduced to such an extent that the net result will be a fair profit. The railroads normally consume something over one-quarter of the total output of the bituminous mines and a reasonable program of storage involving this proportion of the total coal supply undoubtedly would exercise a strong influence in overcoming the evils of the present highly speculative condition of the soft coal mining industry. A study of the problems involved in satisfactorily establishing such a program is, therefore, worthy of vigorous prosecution by the railroads throughout the country.

Letters to the Editor

Labor Union Guarantees

ST. PAUL, MINN.

TO THE EDITOR:

Will some one offer a reasonable explanation why the various railroad labor organizations, when they contract with the railroads to carry out the provisions of their schedules, could not, in all fairness and as an efficient business method, be required to guarantee their contract performance by a suitable bond?

For instance, a concern will make a contract with a railroad to handle its coal docks—a matter of comparative minor importance—and the first requisite is for the contractor to give the railroad a satisfactory guaranty bond. But a railroad will contract with labor organizations for the most important feature of its operation, and all they secure are a few signatures, which means the contract provisions can be and are violated with impunity.

A certified check of a railroad union, securely deposited as a guarantee for faithful performance, would, in my opinion, go a long way to prevent injudicious action on the part of union officers and members. As long as these affairs are cold business propositions why not bind the bargain on *both sides* in the way I have above mentioned? It is not a matter of intangible honor—it is a matter of tangible dollars—so let the dollars do the work. I believe it would put a stop to a good deal of railroad labor trouble, could make "unauthorized" strikes unknown, and do much toward guaranteeing the men and the railroads a squarer deal.

AN OBSERVER.

Salaries of Railroad Officials

NEW YORK.

TO THE EDITOR:

The article bearing the above title, which appears on page 751 of your issue of November 26, and your editorial on the subject in the issue of November 14, are interesting reading. It seems that Representative T. W. Sims, in a speech before the House, makes the statement that the salaries are exorbitant and extravagant and in order to prove his statement gives the amounts of the salaries received by the 23 highest paid officials of the U. S. Government.

It is said, and truly, that comparisons are odious, but if Mr. Sims wishes to draw them he should by no means stop where he does, but in all fairness should go on far enough to enable the drawing of some just and reasonable conclusions from his comparisons. He should go on clear down the line and show that as a class the employees of the railroads of this country are today drawing as high a rate of compensation for the service rendered as any class of employees in the world. He should also show that the employees of our government are drawing a lower rate of pay for the service they are supposed to render than any other class of employees in this country. He should also show that these same railroad employees were at least 25 per cent more efficient under the management of the men given in the list referred to than they were under government management. One of the first acts of our government when it took over the railroads was to abolish piece work, and as a result it took ten men to do the work heretofore done by six men. Here is a difference of 40 per cent.

The 23 government offices named were created and had salaries attached to them before railroads existed, and there-

fore there must have been a time when the salary paid to any one of these 23 government officials was much higher than that paid to any railroad officer. There must be some good and sufficient reason for the change which has taken place, and perhaps the best explanation can be found in the results which have followed. In the period during which it has been gradually brought about there has been an increase which is almost beyond the grasp of the human mind, in the volume of the business handled by both groups of officials, and also in the intricacy and complication of the problems which they have had to solve. While this was taking place the records show that on the railroads there was a corresponding increase in efficiency and economy of operation.

The job of the railroad operating officer is to produce transportation, and the railroads of this country, while under the management of the 208 general officers whose names are given in the list referred to, were producing railroad transportation at the lowest costs ever known. There has never been a time or place where as much railroad transportation, either freight or passenger, could be purchased for a given amount of money as from the railroads of the United States during several years before the government took over their operation. Taking them as a whole, our railroads were at this time the most complicated and at the same time the most efficiently managed industry the world has ever known.

The reason that these men were able to consummate this wonderful achievement was, as you say, because they began at the bottom and worked up. Any one who knows the game knows that it was work all the way. Taking them as a class, the fact that any man reached the top was proof that he was a man of more than ordinary ability and a big man in every way, because this road is not traveled by any other kind. There may be some exceptions to this rule, but if there are they are so few that they are not worthy of consideration when looking at the subject as a whole.

Railroad management is the most complicated and most difficult management the world knows because the human element enters into it to such a great extent. Most any one can manage a lot of machines because machines have a set pace and can always be depended on to do certain things, but human beings have no set pace and by far the largest percentage of them are not dependable. An indifferent manager of men can make a good showing when he comes in fairly constant personal contact with his men, but when the manager must be distant from them at long intervals he must be a big man and have a strong personality in order to retain their loyalty.

There is no other line of business which depends so largely on the human element, and therefore so largely on the loyalty of the employees. The manner in which one or two disloyal, disgruntled, inefficient or lazy employees can tie up a whole division of a railroad is simply appalling, as every man who has been a division superintendent knows to his sorrow.

What about the salaries? They are only an incident and one of the smallest in the consideration of the subject. The little old law of supply and demand fixed them as, in the long run, it fixes most things in this world. We are hearing a lot about human effort of certain kinds not being a commodity and not being for sale, but the name which you give it does not seem to change its status very much, as it is always up against this law and always will be so long as human nature is what it is. The salaries have been increased from time to time as demanded, and I mean demanded, by this law.

And while the railroads were going ahead in this way what was our government doing? Was it keeping up? It was not. It was not even holding its own, but actually going back, and, outside of the military departments, there is probably not a single one of its many activities which is

not carried on with less efficiency than it was 25 years ago, and today it is wasteful and inefficient to such an extent as to almost imperil its very existence. This does not apply to our Navy Department, which is efficient, and the reason is set forth by Admiral Fisk in his recent book, "From Midshipman to Rear Admiral," in the following statement:

"In the Navy no young man can be admitted to the lowest class in the naval academy unless he is of good moral, mental and physical character; he cannot graduate until after he had passed a satisfactory moral, mental and physical examination of great rigidity; he cannot be promoted to any rank thereafter until he has passed rigid moral, mental and physical examinations."

This is why our Navy is efficient. It recognizes and rewards good work. Admiral Fisk says further: "Yet in almost every other government organization—Congress, the Supreme Court, the Cabinet, the departments and all state and municipal positions, no examination of any kind is held, and the matter of fitness for a position seems to be the last point considered in appointing a man to fill it."

This is the reason for government operation under these departments being inefficient and wasteful. Good work is neither recognized nor rewarded.

The railroads, taking them as a whole, and during the period referred to, recognized good work and rewarded it. There was always a demand for good men and the employees knew that their advancement depended on their industry and ability. As an example: About 25 years ago one of the officials whose name is in the list referred to was filling a subordinate position and drawing a salary of \$3,500 a year. A manufacturing company offered him a position at a salary of \$12,000 per year and he refused the offer, saying that he expected some day to be president of the railroad for which he was working. He is almost there now.

Mr. Sims says in his judgment the Pennsylvania is the greatest railroad system in this country, and in the year 1917 it had a president at a salary of \$75,460 and eleven vice-presidents at salaries beginning with \$40,620 and running down to \$25,000. Can it be that it has not occurred to Mr. Sims that one of the reasons for this being the greatest railroad system is *because* it has these officials and pays them these seemingly high salaries.

As a general rule, when a man buys anything he comes pretty near getting what he pays for, and this rule applies particularly to the purchase of service of any nature. Service is purchased to fill certain specifications and withstand certain tests just as materials are, and the price commanded by both is governed largely by the specifications they will meet and the test they will withstand. Any price paid for a piece of material is exorbitant if that material fails. Any price paid for service is exorbitant if the service is not delivered, and there is no redress. Good material has always commanded a high price and always will. Good service has always commanded a high price and always will; and in the long run, as a general rule, the highest priced material and the highest priced service are the best investment.

Our government chooses to use low priced service and gets just what it pays for.

CLEMENT F. STREET.

PEAT CONSUMPTION IN IRELAND.—It is estimated that at the present time the Irish bogs contain between 3,500,000,000 and 4,000,000,000 tons of anhydrous peat, or 5,000,000,000 tons of air-dried peat. At present about 6,000,000 tons of peat are burned as fuel in Ireland per annum and over 4,500,000 tons of coal are imported. If this coal were replaced by peat fuel at the rate of two tons of air-dried peat to one ton of coal, the total consumption of peat in Ireland would be about 15,000,000 tons per annum, and the peat deposits would be sufficient to satisfy the fuel and power requirements of the country at the present rate of consumption for more than 300 years.—*The Engineer*, London.

The Condition of Rolling Stock in France Today

A Great Sufficiency, but Task of Putting It In
Condition Is a Difficult One

By Francis Jaques

PARIS, France.

"THE FRENCH RAILROADS at the present time are to be considered as being among the seriously wounded of the war, and neither the armistice nor the coming of peace can put them on their feet as with the touch of a fairy wand." Such were the words of one of the leading French railroad men shortly after the armistice, and the serious condition of the railroads today only goes to bear out the truth of his statement.

The rolling stock suffered particularly, for the magnificent effort of the railroads during the long war—one of the principal factors of the final success—was made under such conditions that it was practically impossible to make repairs or replace the worn-out equipment until the arrival of the Americans. As a result of this long-prolonged strain the condition of French rolling stock today is deplorable, and this is one of the causes of the very serious transportation crisis which is having such a disastrous effect at the present time on the whole life of the country.

It should be distinctly understood that it is not from a

lack of equipment that France is suffering, but because its rolling stock is in exceedingly bad condition, literally worn out by the effort of the war. We shall first give some figures, which are extremely eloquent, showing the quantity of rolling stock in France before, during and after the war, and then explain what measures are being taken to improve conditions.

In addition to this rolling stock belonging to the principal railroads, the enemy captured locomotives, passenger cars and freight cars belonging to the secondary railroad companies, to the mines and to private parties. An estimate has never been made of the amount of this equipment taken.

France has already received, and is now receiving, a certain amount of rolling stock from two sources, the so-called "Felton Equipment" and German equipment. This is not included in the above figures.

The "Felton Equipment" is rolling stock ordered by the American army from America during the war by contracts with various companies. The coming of the armistice naturally made a vast change in the state of affairs, and the American army no longer required this equipment. The French government, therefore, being in need of rolling stock, took over the contracts for the delivery of this "Felton Equipment," which is quite apart and in addition to the 1,300 odd locomotives and 19,000 odd cars left in France by the American army for the French government. The following are the figures with regard to the so-called "Felton Equipment" which is being erected by the Middletown Car Company—the cars at St. Nazaire and the locomotives at La Rochelle:

EQUIPMENT FIGURES				
Freight Cars				
Railroad	Aug. 1, 1914	Aug. 1, 1917	Dec. 1, 1918	Nov. 1, 1919
Paris, Lyons & Mediterranean..	105,578	107,754	108,971	109,433
Etat (State)	59,874	70,809	77,413	76,109
Paris-Orleans	43,235	48,382	51,071	52,155
Nord	76,625	49,870	52,281	54,440
Est	59,183	44,561	49,775	48,111
Ceintures (Paris belt lines).....	.....	.....	.....	.....
Total number of freight cars	373,553	350,717	368,954	371,359
Number of cars under repair belonging to railroads.....	13,060	28,088	36,342	50,391
Number of cars under repair belonging to private parties.....	.....	.....	.....	13,514
PASSENGER CARS				
Railroad	Aug. 1, 1914	Aug. 1, 1917	Dec. 1, 1918	Nov. 1, 1919
Paris, Lyons & Mediterranean..	10,503	10,377	10,327	10,338
Etat (State)	9,192	9,198	9,276	9,126
Paris-Orleans	8,151	5,807	5,606	5,621
Nord	9,483	7,320	7,102	8,561
Est	6,875	6,216	6,637	6,170
Midi	4,799	4,775	4,739	5,576
Ceintures (belt lines).....	317	314	313	313
Total number of passenger cars	49,320	44,007	44,000	45,705
Number of cars under repair...	3,988	5,094	7,072	.....
LOCOMOTIVES				
Railroad	Aug. 1, 1914	Aug. 1, 1917	Dec. 1, 1918	Nov. 1, 1919
Paris, Lyons & Mediterranean..	3,651	3,787	4,127	4,306
Etat (State)	2,863	3,033	3,295	3,393
Paris-Orleans	2,084	2,167	2,405	2,592
Nord	2,359	2,603	2,614	2,449
Est	1,956	1,948	1,976	2,152
Midi	1,032	1,026	1,078	1,062
Ceintures (belt lines).....	102	138	149	139
Total number of locomotives	14,047	14,702	15,644	16,093
Number of locomotives under repair	1,146	2,031	2,733	3,540

EQUIPMENT BELONGING TO THE PRINCIPAL FRENCH RAILROADS, CAPTURED BY THE ENEMY. FIGURES AS FURNISHED BY THE RAILROADS ON OCT. 1, 1918.

Railroad	Locomotives	Passenger cars	Baggage cars	Freight cars
Paris, Lyons & Mediterranean..	7	39	39	980
Etat (State)	38	43	43	2,341
Paris-Orleans	1	64	64	2,026
Nord	76	575	603	29,788*
Est	14	80	116	11,810
Midi .....	.....	252	252	574
Ceintures (belt lines).....	.....	.....	.....	.....
Total	91	1,016	1,053	47,519

* Including 7 locomotives, 146 passenger cars and 6,292 freight cars belonging to the Belgian Nord Railroad.

"FELTON EQUIPMENT"

Freight Cars—	
Total number	19,860
Now in service	8,043
Locomotives—	
Total number	485
Already assigned to French railroads.....	431
Assigned to Roumania	15
Not yet assigned	39

A certain amount of rolling stock has been received by France from Germany as her share of the 150,000 cars and 5,000 locomotives assigned to the Allies by the armistice. Its final disposition has not yet been decided by the Peace Conference, but it is expected that France will keep as much of the equipment as it needs, returning the rest to Germany. In this case the value of the equipment kept will be probably deducted from the amount of the war indemnity which Germany will have to pay. The following figures show the amount of this equipment received by France to date:

Freight cars	63,871
Passenger cars	5,953
Locomotives	2,749

Intensive Use of Equipment During the War

It will be seen from all of the accompanying figures that there is not a lack of rolling stock in France today, but that the amount of equipment under repair is deplorably great. By the third year of the war the quantity of rolling stock was very low, most of this equipment having been lost at the very beginning at the time of the battle of Charleroi. This loss, coupled with the decrease in the number of the personnel, was felt tremendously. This was all the more the case because of the fact that the needs became greater and

greater. It was not until 1916, however, that a certain number of passenger trains were taken off in order to try to help the situation.

The greatest effort came at the time of the powerful German offense at the end of March, 1918. The Nord and Est railroads had to increase nearly ten-fold the number of trains moved daily for military purposes. When the enemy was advancing rapidly on Amiens, an important train escaped one day by its speed while the Germans and French were both heavily bombarding the line.

In November, 1917, the Paris, Lyons & Mediterranean was advised only 48 hours ahead that it would have to move 100,000 French and English troops to Italy, supplying them with food and ammunition. In spite of the difficulties of the country through which this movement had to be made, the Paris, Lyons and Mediterranean accomplished this formidable task as desired and without increasing its personnel.

During the war the traffic on the Nord, Est and Paris, Lyons & Mediterranean was 80 per cent greater than in time of peace, and all this had to be handled with a smaller amount of rolling stock and a greatly reduced personnel. The task of the personnel was still further complicated on the Nord by the fact that it had to work in collaboration with a personnel only speaking English and operating on the same lines.

American Assistance

With the arrival of the American army in France, the transportation requirements became even greater. The leaders of the American Transportation Corps, however, soon adopted very radical methods to improve the situation, always remaining in close collaboration with the French. Arrangements were made to import a large number of freight cars and locomotives from America, and these were erected by the American army in France. The Americans worked in the shops either independently or together with the French workmen. The former method was found the more successful because of the impossibility of rapidly accustoming men to work together of two races with such radically different customs, methods and hours of work, and speaking different languages.

Towards the end of the war, when speed was of vast importance, erected locomotives were imported from America and unloaded in France with the huge cranes which the American army had installed. This feat was accomplished with very successful results.

Thanks, therefore, to this American assistance in importing cars and locomotives and in repairing the worn-out French rolling stock, the equipment situation began to improve towards the end. It was high time, for the condition of the French rolling stock was indeed desperate in April, 1917.

Proposed Measures for Increasing the Quantity of Serviceable Equipment

By the addition of the American and German cars and locomotives to the French stock, a total amount has now been reached which is not far from that in existence just before the war. A glance at the figures at the beginning of this article will show the vast amount of equipment under repair which has accumulated during the war. Some of this rolling stock has been literally used up to the extreme limit, and, like the famous "one hoss shay," is on the point of falling to pieces. For this reason it has even been proposed to destroy a great many cars which are beyond repair and are taking up siding and yard space all over France. A short trip in any direction will soon convince the observant traveler of the wisdom of this proposal.

On August 29, 1919, M. Claveille, minister of public works, sent a note to the railroad companies in which he

insisted for the eighth time upon the necessity for adopting exceptionally radical and energetic measures for relieving the serious transportation question. He urged that efforts be made to stop the rapid increase of bad order equipment. He suggested that the companies use the artillery and powder shops, now useless, and also the installations left in France by the Americans and English for this work. He asked the companies, utterly unable to cope with the situation themselves, to make contracts with private firms, and drew attention to the fact that the measures proposed in his circulars of December, 1918, and January, 1919, had not been carried out.

On October 2, 1919, M. Claveille sent a new letter to the principal railroads stating that he considered the situation as very serious. In that he says: "Our situation is such that not a minute is to be lost for adopting all the remedies, without exception, which may have a favorable influence on the operation of the railroads." The minister requested that a report be submitted to him by October 15, suggesting measures to improve the transportation situation.

The Technical Committee for the Operation of Railroads replied in a formidable document. The following passages of this report are extremely enlightening with regard to the equipment situation:

"The effort of the French railroads, so important a factor in the successful result of the war, was made under conditions which rendered the repairing and replacing of rolling stock impossible. This has caused a general depreciation of the equipment and lessened efficiency of personnel.

"The defects existing before the war have increased. In quantity the amount of rolling stock is at present sufficient. There were more locomotives and more cars in August, 1919, than in 1913.

"It is not, therefore, the number of cars which is not sufficient, for we are waiting for equipment to be delivered to us which represents about 1,500 locomotives, 3,000 passenger cars and 36,000 freight cars.

"However, although it is true that we have so many cars, we have the following percentage of worn-out equipment which needs repairs.

"Locomotives, 20 per cent instead of 9 per cent in time of peace; passenger cars, 26.4 per cent instead of 8.8 per cent, and freight cars, 15.7 per cent instead of 3.7 per cent.

"Also, among the other locomotives, unfortunately not a day passes but what a great many have to receive some slight repairs which keep them out of service. This fact has a considerable and disastrous effect on the regularity of the operation of trains.

"Without delay, repair shops are going to be created in connection with the engine terminals, and small yards are going to be built everywhere, following the example set by the Paris, Lyons & Mediterranean, in order to reduce the lengths of hauls for equipment.

"On October 1, 1919, 193 contracts were being made for the repairing of rolling stock, 52 for locomotives, 54 for passenger cars and 87 for freight cars.

"On the other hand, with the application of the 8-hour law, it is to be feared that we shall soon lack locomotives. It will then be necessary either to give up the facilities given the workmen by the 8-hour law or operate the locomotives under the pool system."

The Technical Committee did not believe it its duty to make this decision.

The above passages from the report of this committee give a very good idea of the serious situation with regard to rolling stock, resulting not from the lack of equipment but from its bad condition.

Motive power difficulties are made still worse by the very poor quality of the coal. It often happens that the coal which has to be used is not even in the form of "briquettes," but is literally dust. If a fireman rakes his fire down a

little too energetically, he is liable to cause it to fall through the grate.

American firms will naturally be eager to know whether American assistance is going to be called upon to relieve the serious situation in which the French rolling stock now is, and, if so, what the business opportunities will be. The writer does not believe that much raw material will be imported from America. It is the policy of the present French government to restrict importations as much as possible in order to protect French industries and to try to stop the disastrous fall of the franc which is at present ruining France. Then, too, as a result of the war, France has acquired the opportunity of obtaining minerals in large quantities from the region of the Saar, and a great many orders have been placed in that district.

One of the great difficulties with which the French have to cope at present is the lack of organization. In this respect, American firms could co-operate with them by the organization of repair shops, employing French workmen and material. Unfortunately, however, the state of mind of the workmen in France is now very much upset. There is a widespread fight for shorter hours and higher pay, and this is coupled with a general spirit of laziness mingled with "bolshevism." The application of the 8-hour law has come too rapidly, and the workmen, encouraged by the fact that their reasonable demands were granted at once, are

To return to the rolling stock situation, it may be said, therefore, that there is equipment enough in France today or ordered; but that the great difficulty arises from the amount of bad order cars and locomotives. The remedy lies in the destruction of the equipment beyond repair, and in the proper organization of shops to put into shape the vast quantity of rolling stock now lying idle and blocking the traffic and rendering the proper operation of the railroads impossible. The solution of this problem is a vital one for the future of France, and there is an excellent chance for American concerns to get their share of the private contracts being made, upon condition that their work be organized and executed in France.

Large Coaling Station

Embodies a New Feature

PROVISION FOR THE PREPARATION of coal for stoker-equipped engines is a feature of a large coaling station recently completed for the Norfolk & Western at West Roanoke, Va. The 1,200-ton coal pocket is divided into two bins of 600 tons capacity each. One of these is for the storage of lump coal and the other one for screenings to be used in the stoker-equipped engines. Each of the bins



General View of the New Coaling Station at West Roanoke

now inclined to go too far, asking for such short hours and such large wages that the companies would be unable to operate the railroads under such conditions. One of the highest railroad officials in France said recently that, in his opinion, if matters kept on going in the same direction as at present, the only solution of the financial problem would be to increase the rates by 100 per cent. The effect on the public can be imagined.

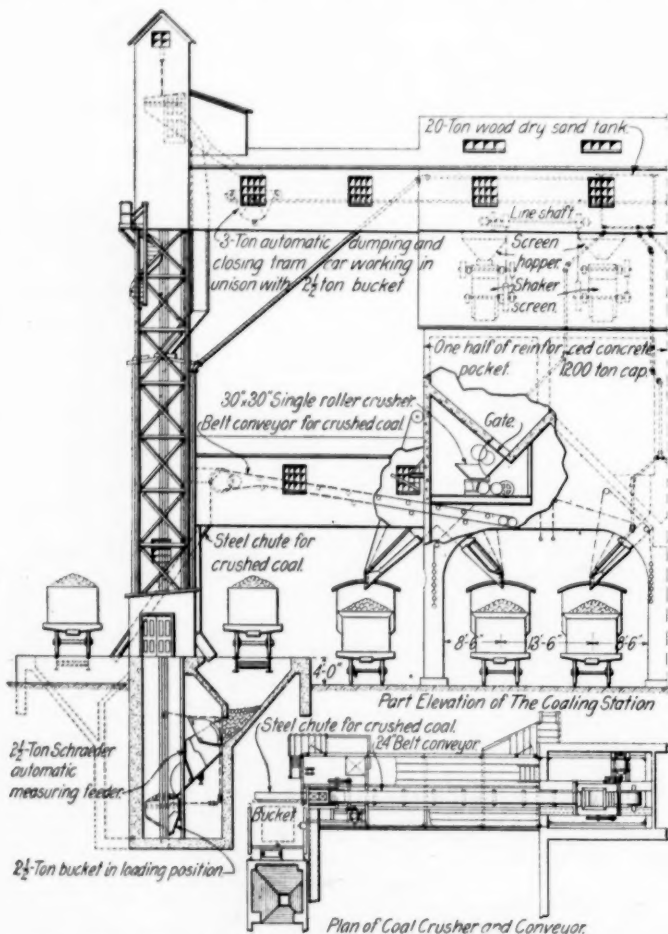
is provided with six spouts to deliver coal to engines on six tracks simultaneously.

To grade the coal for the two bins it is screened with electrically-operated shaker screens, which divide the coal into the two grades, that through two-inch perforations dropping into one bin and all the oversize coal passing off the end of the screen into the lump coal pocket.

To take care of a possible inadequate supply of the fine

coal as obtained merely by screening the run of coal delivered to the station, provision has been made for the manufacture of screening coal. An electrically operated crusher is included in the equipment, being installed as shown on the drawing under one end of the lump coal pocket, so that the coal from this bin may be run through this crusher. The crushed coal is carried by a belt conveyor to the elevator tower, where it may be chuted to either track hopper and returned to the storage bin.

This coaling station was designed and erected by the Roberts & Schaefer Company, engineers and contractors, Chicago, and all equipment for handling the coal conforms to



Elevation Showing Track Hoppers and Elevator and One-Half of the Storage Pocket

the standard designs of that company. There are two track hoppers for receiving coal and two separate elevating towers, each having a capacity of 75 tons of coal per hour. The delivery of coal from the elevator bucket to the bins is accomplished by two tram cars running on independent turnways according to an arrangement used previously in other large stations of the same type. These tram cars each dump coal into any one of four hoppers, the hoppers being arranged in pairs over transverse conveyors that deliver the coal to the four sets of shaker screens.

This station is also equipped with the "R and S" gravity sand plant and Beamer steam sand dryer. A reinforced concrete bin of 120-ton capacity is provided for the wet sand between the two coal elevator towers with the dryers located beneath. The dry sand is delivered to a 20-ton capacity dry sand tank in the deck house above the coal pocket from which the sand is chuted by gravity to each one of the coaling tracks. This station was designed and built under the direction of J. E. Crawford, chief engineer of the Norfolk & Western.

Coal Loading Heavy

DESPITE THE GREAT difficulties in getting empty coal cars back to their normal channels of traffic after the extraordinary dislocation during the coal strike, gratifying progress is being made in supplying empties at the coal mines, according to a statement issued by the Railroad Administration on December 19.

On December 12 1,058,000 tons of bituminous coal was produced, equivalent to 52.5 per cent of the pre-strike average. By December 16 this volume had risen to 1,595,000 tons, or 79.1 per cent of the pre-strike average (based on the high rate of production during October), or in other words 30,392 cars, a greater amount than the average daily production during the corresponding week in December, 1917, which average was 30,000 cars, and it is considerably in excess of the production during the corresponding week of December, 1916 and 1918.

"Inevitably there are car shortages," the statement says, "but they are not as numerous as might have been expected. It is highly probable, however, that the next few days will be exceptionally difficult in a few fields. The Railroad Administration, in co-operation with the National Coal Association, is doing everything possible to remedy the abnormal conditions, and it is expected that very shortly all facilities for the transportation of coal will be again on a normal basis."

"On December 10 attention was called to the dislocation of production, transportation and distribution of coal caused by the miners' strike, and expressing the hope that the general public, the coal operators and the miners will all appreciate these difficulties and will make allowances for the time required to restore normal conditions."

"This interruption of normal activities inevitably resulted in a disarrangement of coal car supply, in that the needs of the public, being of paramount concern, necessitated the movement of great numbers of cars great distances from the source of loading and into sections of the country not usually supplied from sources which were called upon during the period of the strike. For instance, certain mining regions had therefore always shipped their coal to the Atlantic seaboard, but owing to the pressing needs of the Middle and far Western states much of this coal was transhipped there, resulting in depleting somewhat the territory east of the Alleghenies and in operating difficulties in returning these cars to the mines. Adverse weather conditions in many sections are adding to these difficulties."

"No more coal is being held in storage on wheels than territorial needs make advisable, and every possible effort is being made with a view to the expeditious handling of empty cars."

Following is a statement of the average daily car loading of bituminous coal for the week ending on December 20 for the years 1916, 1917 and 1918, as compared with the car loading for December 17, 1919:

Region	Roads	Average loading per day week ending December 20			Loaded December 17, 1919	Percent- age as compared with 1917
		1916	1917	1918		
Eastern	24	4,230	4,865	4,560	4,629	95.1
Allegheny	24	7,404	7,758	9,380	9,143	117.9
Pocahontas	6	4,000	2,914	3,400	4,699	161.3
Southern	17	3,900	4,756	4,357	5,664	119.1
Northwestern	12	1,950	2,123	1,776	1,174	55.3
Central Western	27	4,957	5,770	4,310	5,932	102.8
Southwestern	19	2,608	1,566	2,190	1,748	111.6
Total	129	29,049	29,752	29,973	32,989	110.9

THE NORTHWESTERN PACIFIC has secured from the Railroad Commission of California an extension to December 31, 1920, of the time granted by the Commission for the sale of its bonds.

Economics of Freight Car Maintenance and Operation

Relative Saving Effected by Rebuilding or Retirement—Great Increase in Cost of Repairs

By L. K. Sillcox

Master Car Builder, Chicago, Milwaukee & St. Paul

THE ECONOMIC SITUATION with respect to the performance of that great vehicle of commerce, the freight car, is one of basic importance. Any success in railroad operation corresponds largely to the net number of car miles attained per car per day, which figure ought to be as nearly 40 or above as possible. Why many roads are only showing 30 or even less miles is probably due to many causes beyond the exact knowledge of the writer, but in any event, so far as the problem is affected from the standpoint of design, maintenance and inspection of freight car equipment, there are a number of conditions which deserve calm and clear analysis.

The comments which follow are submitted with due consideration for the varying experiences and circumstances which obviously have to be allowed for, knowing that they must be met conservatively and frankly in view of whatever limitations may present themselves. We are dealing with a work which in practice is responsible for millions of dollars expended annually, and each individual task in design and maintenance deserves its full share of study and careful analysis. The inspection of freight trains can be discussed on a more uniform basis and greater similarity in practices can be obtained than at present, and I think to considerable advantage.

Weak Draft Members Most Serious Defect

One noteworthy fact, the explanation of which I have tried to investigate, should be first mentioned. Of all the complaints which are general in the operation of freight train equipment at the present time, the behavior of the weakly constructed design of car is found to be the most perplexing, principally due to draft attachment failures in combination with dangerously inadequate running gear members, such as truck, side frames, axles and bolsters. Although this difficulty is in greater measure due to wooden underframe cars, yet it is also noticeable in the case of improperly designed steel cars. Right at the present time there is a tremendous demand for suitable cars, which is not being satisfied, and yet it would appear to any thoughtful man that too many cars are standing idle which ought to be making their just proportion of revenue mileage. It does not seem to be altogether a case as to shortage of cars, but rather a matter of having more cars made really and honestly fit.

It has been said that a very large percentage of cars should be destroyed, especially those of wooden construction. A careful check, extending over a period of seven months in normal heavy trunk line service, has demonstrated that we can expect about 20 per cent or 30 per cent of the house cars used at this time to be of the type which we generally term as weakly constructed, not being as yet reinforced with metal attachments or ends. The problem to be determined in a decision concerning the retirement or reconstruction of any such car is generally influenced by the distinctive demand for the equipment on the owner's line and a knowledge of whether the expense of betterment or improvement to the existing equipment is offset by the capitalized value

of the saving which can be realized in the maintenance account, as well as keeping in mind the better characteristic operation which is practically guaranteed from such a program.

Extended observation has often brought out the fact that the capitalized saving in the repair account through the adoption of an intensive retirement program and the acquisition of new high capacity units in equal number or tonnage, which are bound to present very much greater service capacity and earning power, if there is a paying demand for tonnage space, has proven most practical. It will never be found possible satisfactorily, to determine upon any general policy without a most careful unit study for each class of car, besides being fortified with a liberal knowledge of the exact operating possibilities of the property owning the equipment.

Repairs of Foreign Lines Must Be Considered

Another serious limitation to our field of selection in the matter of deciding between reinforcement or retirement, and subsequent replacement in satisfactory designs, is the fact that the majority of defects occurring in connection with car equipment when off home lines, except in case of derailment or fire, have only in late years been made owner's responsibility.

This is where a vast amount of money is apt to be applied beyond the control of the car owner, and will undoubtedly bring about, of its own accord, more systematic analysis in the future as to deficiencies in each class of car in order to guard against the possibility of duplicating repairs to failed members which do not meet present-day requirements; so that the sum total of expense for any class of rolling stock does not become excessive, due to a large part of the work being repeated so continuously and carried out beyond the immediate observation of the car owner, resulting in extravagance, though not necessarily for the total equipment owned. Of course, under these circumstances excessive maintenance charges will not often be so easily reflected in system statements covering total ownership, but only in particularly grouped classes, which it may be desired to observe.

Attention Before Loading Prevents Delays

It is especially urgent that the best interests of the shippers and dealers, as well as of the railroads which serve them, be maintained by the inauguration of substantial repair practices which will insure a minimum delay of cars on shop tracks and line or road chargeable to their general condition and style of construction. Thorough inspection and repairs of cars before loading, and careful attention to brakes, lubrication, running gear and lading after classification at originating terminals, are a fundamental necessity.

Cars set off on the line, due to bad order condition of couplers, draft rigging, wheels, brakes, heated bearings, shifted lading and other similar causes, are usually the outcome of lack of proper attention at the originating terminal, which results in accidents, destroyed lading and cars, reduced train rating, delays to traffic, blocking of passing tracks, engine and train crew overtime and extraordinary

*From a paper presented before the Western Railway Club, October 20, 1919.

expense for sending men and materials out on the line to eventually make repairs.

Weak Cars Should Be Kept on Owner's Lines

At the present time nearly all systems are offering in interchange some load and empty cars that are of such design or condition as to make them entirely unfit for the service to be performed on the average trunk line railroad. This class of equipment, which cannot be depended upon to pass properly in main line movements, should be restricted to owner's lines, where it can haul the maximum amount of commercial and company lading with the least liability for delays, transfer or repairs. When a freight car of undesirable class and capacity has outlived its usefulness, from the standpoint of commercial utility, age, decay, corrosion, obsolescence or accident, so that the expenditure necessary to put it in serviceable condition is not justified, it should be dismantled forthwith. The intensive movement of tonnage, creating an acute demand for power and a severe congestion in terminals, has at many points made it impractical, due to the time consumed and necessary switching required, to place weakly constructed cars in the rear of long trains. That is why this subject looms so prominently before us today. Tremendous damage is done to these weak cars, and especially when not protected against the hammer blows of modern operation. Not only this, but delays and accidents are multiplying daily from the continued handling of these weak cars in this manner.

There is no question which demands so much attention and would result so advantageously as a serious and clear investigation covering the proper design for recommended reinforcement of existing obsolete equipment, with a view of causing it to be mandatory to so strengthen cars or retire them for interstate service, as well as that of shops and facilities, provided for its construction and upkeep.

Repair Facilities Are Inadequate

Freight car repair yards have been located at inconvenient out-of-the-way places; repair tracks have been set too closely together for convenience; the facilities for repairing have not been the best, and the consequence has been that cars which should have been returned to service promptly and with repairs properly made have been held out of service longer than necessary and were not properly repaired. Never before has there been such pressing necessity for intelligent work, for proper tool equipment and for shelter for the men employed as at the present time. It is a reflection on good judgment when cars are held out of service for which there is a paying demand at the time, and it would appear that with the attention now concentrated on the railroads, the best efforts are not only desirable but are absolutely necessary for a relief of the conditions considered.

The scope of the operations in commercial value; the great numbers of men coming under the control of the mechanical department; the drift of the times concerning methods for carrying out the work, and the very intensive service necessary to transportation matters, as well as the growing importance of economics, all tend to make us focus our attention on these questions. There is no denying the fact that all these matters involve, more than any one thing, the element of men, and if we are going to get the best from our men we must provide responsible supervision, with necessary support and initiative, so as to maintain action and make good from day to day. The moral responsibility of every one is as great and as constant, whether one is here or there, or doing one thing or another, and this responsibility is in exact proportion to the intelligence of the individual, coupled with whatever measure of freedom for action is allowed. It implies leadership and teaching, not in some things to be sure, but in all of the relations that bring individuals to-

gether in industry and business, so that our choice, especially among our highest supervisors, should be along most practical and fundamental lines. This is only referred to as a timely suggestion, since it has so far-reaching an effect that words could not be found sufficiently to emphasize its importance.

Greater Interchangeability Desirable

The first division of the subject assigned to me has regard for the design of rolling stock. I do not think it is reasonable to believe that the roads will adopt and maintain one standard type of car indefinitely to a single inflexible pattern. There are sure to be improvements and modifications which different groups of railroad men think it desirable to make, and such motive would be difficult to subdue. It would seem proper for the draft lugs, truck frames, truck bolsters, center plates, striking castings, coupler carriers, brake beams, truck springs, drawbar yokes, uncoupling mechanism, brake hangers, drawgear carriers and center-plate height of truck to be standardized and made interchangeable to a greater degree than at present, both in new and repair work.

It does seem indefensible that the slight variations made in these parts should necessitate their being obtained from the car owners. In designing a car, what must be considered is the service in which its paying demand rests, not the service in which it may possibly run. It is only fair to assume that every railroad management aims to place in service cars built in a substantial manner. Standards in detail construction have been adopted by the Master Car Builders Association, which have assisted greatly in reducing the amount of stock necessary to be carried. The difficulty seems to be that these standards have not been enforced under mandatory rules, and their full practical value has never been properly felt on this account. I believe the time has arrived to introduce additional standards affecting the maintenance of box cars which can also be applied to all types used in interstate service.

The application of steel center sills as well as draft arms to old cars will not only prolong their life but cause them to have a more continuous earning capacity, due to not becoming marked out to shop tracks every few hundred miles for the application of draft timbers and end sills, as well as avoiding damage to adjacent equipment and delays to trains and in terminals, to say nothing of the tremendous losses due to damaged lading and loss of patronage, where delays and slow delivery become epidemic.

Poorly Designed Cars Are a Source of Trouble

Mechanical and transportation officers have seen and appreciate the results of poor designing and inferior construction, both as regards wooden and steel cars. One of the surprising features with regard to many steel cars in service which cause the greatest trouble and embarrassment is that they are not of particularly light construction, but the metal has been disposed with very little regard to the engineering feature of service requirements actually encountered. There is no doubt whatsoever but that many of these cars could be built with at least equal or even less weight, and a perfectly satisfactory structure obtained. This is what is so confusing to the minds of executive officers when they have purchased and placed in service not a cheap or even a light car and it fails; then on top of it all it is necessary later to recommend reconstruction and additional expense in order to stop permanently a severe leak in the maintenance account.

New fads in the design and building of car equipment should not be permitted, or any innovations until thoroughly tried out and known to be reasonable and capable of standing up in normal heavy service for at least a period of five

years, besides being passed upon and judged by uninterested, well-experienced and competent authorities.

It is not alone the larger locomotives being used today which have called for a more thorough investigation of the subject of car design and construction, but also the severe shocks which cars are receiving in classification yards. The superstructure of box cars should receive just as much attention as the underframe and trucks, otherwise leakage and subsequent loss of metal roof sheets, through racking and frames not being kept in alignment, is bound to result; when this happens it places restrictions on the ultimate utility of the car for certain classes of service where leakage is detrimental.

Wooden Frame Cars Need Steel Centersills

The strongest argument in favor of the general adoption of the steel underframe, and one which is barely, if ever, touched upon, is the fact that wooden framed cars are always damaged when in collision with steel underframe cars, while the latter escape uninjured. If, because of their decided economy, the more recent designs of metal construction are continued in use, then it is essential that other cars associated with them should be made strong enough to withstand the severe shocks incident to the movement of heavy tonnage trains now so generally experienced.

There is no doubt that the light wooden cars may be strong enough to carry the load for which they were designed, but they need a stiff backbone in the underframe to protect them from being crushed in the middle of a long train or between two heavy cars under impact. The same argument of uniformity holds true of couplers, draft gear and brake equipment. It is for this reason that we must at this time give more positive backing to the need of metal reinforcement programs for cars of light design rather than hesitating on a questionable economy in operating expense, due to carrying larger loads and less dead weight. It simply must be determined whether the cars are to be modernized or retired from service.

Wooden Versus Steel Cars

With respect to the life of the wooden car compared with steel, it is well to state that none of the modern steel cars have been in use long enough in general operation to determine their ultimate length of useful service. It has been found, however, what may be expected of all metal coal and other special classes of cars on prescribed lines having a given commodity and territory; this, of course, is of value for local comparative use only. There is great difference of opinion about the loss of weight in steel due to corrosion, and this may well be expected because of varying climatic conditions, and until some definite conclusions can be drawn, based on a wide range of observation under every service condition, any data used must be employed with caution.

Records indicate foundation for the opinion that wooden cars have been in continuous use from 20 to 30 years, but it is probable that such cars have been rebuilt from the sills up once or even more times in that period, so that we ought not to be disposed to question the assumption of the average life of such cars being 20 years. With respect to the high cost of repairs to wooden as compared to steel equipment referred to, and which is almost always carried on gradually, we must not forget that for steel cars, up until the time rebuilding is necessary, usually only light repairs are made, due to the various roads not being equipped to do the heavy work at this time. Therefore any comparative costs should be viewed with these thoughts in mind and wrong conclusions avoided.

Increase in Cost of Freight Car Repairs

Such a large proportion of failures in units of freight car equipment as is now being experienced appears to indi-

cate that there is something radically defective in the elementary handling of the transportation problem or else the maintenance features have been neglected and have not kept in step with the advance movement of the service to be rendered. The cost of freight car repairs has been continually increasing and in somewhat greater proportion than the advance in labor and material accounts would explain. The tendency for such increases can only be offset by providing all means that aim to reduce the number employed and get the greatest possible output from each man. This not only makes itself felt upon the payrolls but reduces the time cars are held out of service, which is another source of revenue. In dealing with concrete cases, showing the increase in freight car repair costs, a table is shown below for eight of the largest Western railroads:

Road	Year	Number of freight equipment, cars	Average miles per freight car per year	Cost of freight car repairs per car per year	Cost of freight car repairs per mile, cents
A	1916.....	66,409	11,593	\$69.13	0.599
	1917.....	70,396	11,853	68.12	0.558
	1918.....	70,400	12,064	146.52	1.221
B	1916.....	57,401	8,931	53.98	0.60
	1917.....	58,256	8,396	66.64	0.80
	1918.....	55,819	8,987	147.13	1.64
C	1916.....	57,985	10,974	58.76	0.54
	1917.....	47,845	11,171	74.98	0.67
	1918.....	50,079	10,376	133.60	1.29
D	1916.....	46,925	11,098	85.59	0.80
	1917.....	46,281	11,191	126.92	1.13
	1918.....	45,993	10,459	201.23	1.92
E	1916.....	68,339	13,059	74.66	0.57
	1917.....	67,828	14,553	88.46	0.61
	1918.....	69,622	11,145	149.88	1.35
F	1916.....	67,370	13,053	98.16	0.75
	1917.....	67,168	11,214	122.93	1.09
	1918.....	61,457	11,905	266.57	2.24
G	1916.....	63,143	11,646	120.20	1.03
	1917.....	64,919	12,377	113.12	0.91
	1918.....	66,741	12,810	177.18	1.38
H	1916.....	81,034	9,468	71.48	0.76
	1917.....	83,147	9,499	84.84	0.89
	1918.....	72,141	9,377	146.36	1.58

The serious increases in total expense from year to year are attributed more to the character of equipment owned than any other feature, and the logical proposal is, therefore, that more rapid retirement of obsolete equipment should be carried out. When such cars are dismantled and permanently removed from service, one of the features which can be expected to effect a saving and prevent such increases as indicated above is the relative reduction in the amount of material used for repairs to old cars.

It can be fairly well stated that the total car repair expense is about equally divided between labor and material under normal conditions where extensive reclamation operations are resorted to locally, thus holding down the amount of new material obtained to a minimum. Most wooden cars are at least 15 years old, and many have seen 25 or more years service. Comparatively few of the weakly designed cars complained of have been reinforced with metal draft rigging. Failure of draft attachments and associated parts contribute most seriously to the unprecedented increase in cost of repairs. In maintaining these weakly designed cars, such a large part of the available time and expense is absorbed that the better cars are permitted to drift along and deteriorate much faster than they should.

Setting Limit for Repairs Does Not Force

Retirement of Cars

It seems to be a general practice to place small limits of expense on these older cars with the idea that these limits would force such cars to be automatically taken out of service as they become deteriorated beyond a point where repairs would be economical. It can be shown that this equipment is on the repair track a large portion of the time,

and in each instance just sufficient work is done to run the car a little further owing to the policy of concentrating on light repair work first where a demand for equipment exists. Such a plan of retirement does not work satisfactorily, and in the end the roads have far exceeded any proposed sum of money which they planned on placing against these old cars to keep them in service. I do not think anyone who has followed the plan in question has ever found the result in practice any different than stated.

Low Stresses Prolong Life of Parts

During winter months, and at time of heavy tonnage movements, wrecks and delays caused through breaking down of trucks are very serious matters, and the question is always asked as to why such things happen. Fatigue failure in metal truck frames, axles, bolsters and other portions of equipment is characterized by suddenness, and oftentimes occurs immediately after careful inspection has been made. The fractures sometimes disclose a crystalline appearance over part of the surface, and it is this feature which has many times given rise to the term "crystallized." This supposition, however, has been found generally false, since close examination of metals under stress shows no change of the

In static testing steel, under stress of about one-half its ultimate strength, passes into a semi-plastic condition, in which there is a gradual flow of the material. Under such condition the small flaws have almost no effect upon the flow or upon the static strength. When steel is loaded to moderate stresses the yield is almost entirely elastic in general, but a small portion of its inelastic energy being taken up by the steel itself.

In this way it can be reasoned that sufficient material is necessary to any truck side frame or bolster in order to keep down the working load of the material and give long life to the part. Of course, where springs are improperly designed to carry the load truck members receive hammer blows in service for which they were never designed, and this seems to be particularly true in the case of the M. C. B. grouping of springs for 50-ton cars, as often they stand practically solid under the static weight of the car and loading. This is a subject which should be placed before the proper committee of the M. C. B. Association.

As a plan of interesting local foremen in the discharge of their duties it is well for them to have a working knowledge of the money they are spending, and attached is copy of the form shown in Fig. 1, which is filled out daily and wired

UNITED STATES RAILROAD ADMINISTRATION																		
Director General of Railroads																		
CHICAGO, MILWAUKEE & ST. PAUL RAILROAD																		
Distribution of Pay Roll for Month of _____ 19__																		
Station _____ Foreman _____																		
FIRST HALF																		
Township	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Date	Freight Car Repairs	Passenger Car Repairs	Work Car Repairs	Shop Machinery Repairs	Passenger Car Retirements	Freight Car Retirements	Work Car Retirements	Locomotive Repairs	Locomotive Retirements	Dispatchers and Hostlers	Motor Car Repairs	Shop Orders	Coal Chutes	Transportation Expenses	Other Expenses	Total	Man Hours	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
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31																		
Monthly Total																		
Total for Month																		
Grand Total for Month																		

Form Used by Local Foremen to Show Distribution of Pay Roll Expense

general scheme of internal structure, but under severely heavy stress there appears a gradual breakdown of the crystals forming the member.

Metal used for the running gear of cars is more or less ductile, and when these parts are deformed cold the first yielding occurs in the particular grains which either take the most stress or have the lowest elastic limit. The failure in such metals subjected to repeated stress takes place with substantially no general deformation, but there is, however, considerable localized distress among the structural particles, which increases directly with the number of applications of stress.

Car trucks have imposed upon them repeated stress in service, and failure seems to develop in proportion to the continuous mileage made. In analyzing specific cases of breakages, they seem to appear almost exclusively through the unification of yielding particles, with the result that cracks develop with final added stress, promoting the extension of this crack into the adjacent area on both sides. Steel must be considered as filled with a multitude of minute flaws, originating at the time the metal becomes solidified.

to the general offices twice a month. Very interesting results have been obtained from this practice, and it establishes the plan of foremen going over time slips personally to know that labor charges are being properly distributed. With this data, and knowing the amount of work turned out, a good practical analysis is obtained concerning relative efficiency month by month, which guards against excess overtime payments and similar wastes.

On the road with which I am connected practices have been adopted which have done a great deal to unify our efforts, especially in through business, besides positively maintaining the responsibility of each individual engaged and avoiding any duplication of inspection or excess within reasonable mileage limits.

The desire to save time and cost of inspection by resorting to the so-called safety inspection of some roads has about reached its limit. The class of men that railroads are obliged to draw from, in some districts at least, do not make the most expert inspectors. The saving in reducing the number of men and time to make the usual superficial safety inspection oftentimes proves a serious loss, for the result

of a derailment or wreck on account of a loose or defective wheel, or some other important part of the running gear, or brakes which have been overlooked on account of time or judgment, is worthy of serious consideration. No one will deny that all cars are rankly abused, but very little is heard of crews being suspended or even censured on account of damage to rolling stock, no matter what the extent. The ultimate loss cannot be measured by figuring the cost of renewing certain broken parts when cars are handled roughly, for premature failure of other parts will follow.

Consideration of overtime and the sixteen-hour law, as well as expeditious train movement, demands the minimum lapse of time between that for which the crew is called and that when the train departs. Hence a train prepared for departure should require no more brake work after the engine is coupled than, at the most, stopping a few leaks in those couplings and making the formal test. But often today there are greater delays due to making other repairs, or the train proceeds with less efficient brakes than it should have.

To avoid this the repairs required must be determined with arriving trains. The incoming engineer should add to the reduction required for stopping enough to fully apply the brakes, and the brakeman should await his advice that this has been done before cutting off the engine. Car inspectors should be present to make an immediate examination and to bad order all defective brakes. Such repairs as ordinary brake pipe leaks, defective hose and wrong piston travel—those requiring little time—should next be made, but cars requiring heavy brake repairs should be marked for the repair tracks.

In this matter judgment must be exercised, as perishable or other very important loads, as well as empties needed at once for such lading, must not be delayed. Neither should other less important cars be held in numbers far greater than the local force can repair in a day if such force is as great as the regular amount of work, including such repairs, would keep busy. The car foreman and the yardmaster should consult to adjust the foregoing, but when the former removes bad order marks without repairs having been made he should fill out and apply an air brake defect card to better insure prompt repairs at the earliest practicable date.

Discussion

G. S. Goodwin (C., R. I. & P.) stated that at the present time the railroads were justified in making more extensive alterations when reinforcing old cars. He cited the fact that steel frame box cars which formerly could be purchased for \$900 now cost \$3,000.

T. H. Goodnow (C. & N. W.) expressed the opinion that the retirement of wooden cars is one of the most important problems confronting the mechanical department at the present time. There are still in service a great many wooden cars of 80,000-lb. capacity, built between 1902 and 1907, which have as high cubical capacity as cars now being built. These cars will give good service if reinforced, and the work should be done without delay. Mr. Goodnow called attention to the many circumstances which must be considered in analyzing statistics regarding freight cars. He doubted whether any reliable figures showing the relative life and cost of wooden and steel cars were available, because the early all-steel cars were confined almost exclusively to gondola and hopper types, which cost less to maintain than house cars. He called attention to the large percentage of foreign cars which all the railroads had on their lines during 1918, and stated that for this reason the expenditures for freight car repairs did not furnish a true indication of the relative cost of maintenance of the equipment of the various companies. He said the past two years had proved that cars cannot be taken care of as well away from home as when the equipment occasionally reaches the owning road

and favored greater standardization of truck and draft gear parts to facilitate maintenance. He indorsed the system of organization in force on the C., M. & St. P., and stated that an individual car department was necessary in order to get the best results from the local organization.

J. W. Luke (A. T. & S. F.) expressed the opinion that some roads are not keeping cars in fit condition, and the standard of equipment maintenance would not be improved unless the burden of repair work could be distributed among all the roads. From the year 1917 to 1919 the Santa Fe's expenditure for repairs to foreign cars rose from \$1,690,000 to \$7,700,000, an increase of 355 per cent. Mr. Luke advocated the reinforcement of wooden cars with steel channel center sills, and stated that the cost of maintenance of cars so improved compared favorably with modern equipment.

C. Wymer (C. & E. I.) mentioned that sometimes equipment is designed with no thought of future repairs, and the replacement of minor parts necessitates expensive dismantling. Such construction inevitably increases the cost of repairs.

In the course of the discussion Mr. Sillcox elaborated on some of the points brought out in the paper. To emphasize the necessity for retiring cars of wooden construction, he quoted statistics showing that 76 per cent of the cars damaged in service were cars with wooden underframes. The failures were distributed as follows: Draft gear, 63 per cent; knocked off center, 14 per cent; end frame failure, 14 per cent; cornered, 9 per cent. He called attention to the fact that the roads showing the least cost of freight car maintenance had had the most rapid rate of acquisition and also the most rapid retirement. On some roads the acquisition and retirement were so slow that the freight equipment would only be renewed in a period of 40 or 50 years. Mr. Sillcox favored the modernizing of cars of 40 tons capacity, but stated that the reinforcement of 30-ton cars was usually not economical because it would involve an increase in the weight of the car, and since the total weight was limited by the capacity of the axles the maximum allowable load would be less than 66,000 lb.

Orders of Regional Directors

RENTAL RATES FOR LOCOMOTIVES.—Supplement 1 to Order 207 of the Southwestern regional director states that the following will govern with respect to the rental charges for other line locomotives:

"On locomotives delivered by owners having direct physical connection with borrowing road, rental will commence with delivery, and where there is no such connection rental will commence upon delivery by owner to first connecting road.

"The rental will cease with delivery of locomotive to owning line rails, whether there is direct physical connection with owner or not, except that:

"When a locomotive is no longer required by renting line, and instead of being returned to owner is sent elsewhere for service, the rental of delivering line will cease and the rental of receiving line will begin when locomotive is ready for service at point of interchange; i. e., in case where the locomotive is interchanged direct between these roads. If the delivery in such a case involves movement over an intermediate railroad, rental of receiving line will begin when the locomotive is ready for service at interchange point where they receive it."

Incomplete Brakes on Gondola Cars.—Supplement 2 to Circular 201 of the Southwestern regional director states that 500 U. S. Standard hopper cars, allocated to the Pere Marquette, built by the Ralston Steel Car Company and num-

bered 13,000 to 13,499 were placed in service without sheave wheels on brake and hand brake pull rod. The circular instructs that, where these cars are found with sheave wheels omitted on the end of the hand brake rod, changes should be made at once, regardless of ownership.

Weekly Traffic Report

ACCORDING TO A REPORT on traffic conditions for the week ended December 15, made to Walker D. Hines, director general of railroads, revenue freight loadings and receipts from connections for the various regions throughout the country were as follows:

Eastern region—Revenue freight loaded, 197,682 cars, a decrease of 4,687 over same period last year; receipts from connections, 227,692 cars, an increase of 1,709. Allegheny region—Revenue freight loaded, 177,007, a decrease of 13,981; receipts from connections, 150,753, a decrease of 14,401 cars. Pocahontas region—Revenue freight loaded, 36,458 cars, an increase of 1,049 cars; receipts from connections, 15,010 cars, a decrease of 3,558. Southern region—Revenue freight loaded, 118,019 cars, an increase of 2,546 cars; receipts from connections, 75,943 cars, an increase of 5,379 cars. Northwestern region—Revenue freight loaded, 116,709 cars, a decrease of 3,199 cars; receipts from connections, 73,114 cars, a decrease of 1,502 cars. Central Western region—Revenue freight loaded, 105,921 cars, a decrease of 8,446 cars; receipts from connections, 63,357 cars, an increase of 3,721 cars. Southwestern region—Revenue freight loaded, 57,095 cars, an increase of 699 cars; receipts from connections, 49,103 cars, an increase of 3,965 cars.

A summary of the report follows:

Eastern Region—Report from the iron and steel territories shows some deduction in the number of blast furnaces in operation, due to the shortage of coal. The output and movement of traffic to and from a considerable number of industries was largely interfered with by the acute coal situation, but improvement has already begun. Passenger business is good, but curtailment of service, brought about to conserve coal, of course had a serious effect on passenger traffic.

Allegheny Region—Notwithstanding the coal situation there was an increase of one stack in the number of iron furnaces in blast in this region, as compared with same week of last year. There has been a slight improvement in the box and flat car situation. The withdrawal of numerous passenger trains for a few days resulted in overcrowding trains, but service was improved and is now operating on normal basis.

Pocahontas Region—Business generally was affected by the coal situation and also by high water troubles and embargoes. Passenger travel continues good, although earnings are not as large as for the same period last year, which is accounted for by the discontinuance of the heavy military travel of a year ago. A number of passenger trains were also discontinued in this region in order to conserve fuel.

Southern Region—There has been a gradual improvement in the box car situation. Southern Pine Association reports orders received during the week, 3,874 carloads. This is a substantial reduction in average orders, but the association reports an increase in average shipments and average production. Unfilled orders on hand amounted to 24,128 cars. Cotton movement continues active, with a specially heavy movement to the ports for export. Merchandise traffic to Florida is in excess of any previous year, and Cuban freight continues to offer in excess of carrying capacity of the East Coast car ferries. Unprecedented rainfalls during last few days of the week resulted in serious interruptions to traffic generally by washouts. Passenger travel was very good during the week, notwithstanding the general uneasiness which

prevailed on account of the coal situation and curtailment of train service.

Northwestern Region—General business conditions are sound, but some industries have been forced to shut down or reduce their working time, account of coal shortage. However, the general feeling is optimistic as to the future. There is a specially heavy demand for refrigerators to load perishable freight. Lumber and forest product loading showed an increase of 3,792 cars, but grain and live stock loading both showed decreases. Passenger train service was temporarily curtailed on account of fuel shortage.

Central Western Region—Shipments of California commodities requiring refrigerator cars from January 1 to November 24 this year amounted to 123,128 cars, showing an increase of 37,765 cars over the same period of last year. Notwithstanding reduction in passenger train service and efforts to discourage unnecessary travel, the number of passengers handled continued very heavy.

Southwestern Region—Business conditions generally were reported as satisfactory, notwithstanding the fact that some plants were forced to suspend operations and others were unable to work to maximum capacity, account of insufficient fuel supply. Preferred attention is being given to furnishing cars for sugar and rice loading in Louisiana. Rice continues to bring high prices, and there is an active demand, both foreign and domestic. Due to completion of additional pipe lines, there has been an increased production of oil in the Burk-Burnett district, it being estimated that the average daily production in this field amounts to over 100,000 barrels. Gas and oil well activities also continue in Louisiana. Notwithstanding curtailment of passenger train service, regular travel continued above normal, with heavy travel in the Little Rock, Ark., district and from and through Memphis gateway. California travel was quite heavy.

Relative Durability of Green and Seasoned Timber

WHILE OPINIONS have always differed as to the comparative durability of untreated green and seasoned timbers when used for poles, posts and ties, etc., recent experiments of the Forest Products Laboratory, Madison, Wis., indicate that there is practically no difference in their life when exposed to the weather and in contact with the ground.

A test of untreated green and seasoned ties of Douglas fir and western larch, laid in tracks of the Northern Pacific at two different points, showed that the life of the green fir ties was 7.65 years, while that of the seasoned timber was 7.75, a difference of 1/10 year in favor of the seasoned. In the case of the larch the results were about the same, the green ties lasting an average of 7.3 years and the seasoned 7.4 years. Tests of telephone poles showed the rate of decay in green poles to be a trifle less than in the seasoned.

This almost equal durability of untreated green and seasoned poles and ties, or in fact any exposed timber in this condition, is due to the fact that as soon as the timber is placed it begins to take up or give out moisture, according to its condition of seasoning and the conditions of exposure. Thus in a relatively short time both green and seasoned timbers reach the same moisture content, and as this is the determining factor in decay, their life will necessarily be approximately equal. This does not apply, however, to wood used in building construction, as this does not usually dry out so rapidly after being placed, resulting in shrinkage, which is objectionable, and also in decay before it seasons. Only seasoned wood should be used for this class of work.

Second Meeting of Telegraph and Telephone Division

Wire Crossings, Pole Line Construction and Mailgram Service Among Important Subjects Considered

THE TELEGRAPH and Telephone division of Section 1—Operating of the American Railroad Association held its second meeting at the Congress Hotel, Chicago, on December 3, 4 and 5. The resignation of Martin H. Clapp, chairman of the division, made it necessary for the Committee of Direction to appoint a successor, and J. F. Caskey, superintendent of telegraph of the Lehigh Valley and first vice-chairman of the division, was selected and presided at this meeting. These changes made it necessary to fill other vacancies which resulted therefrom, and the Committee of Direction appointed H. Hulatt, manager of telegraphs, Grand Trunk System, as first vice-chairman and W. H. Hall, superintendent of telegraphs, Missouri, Kansas & Texas Lines, second vice-chairman. E. L. King, superintendent of telegraph, Southern Pacific Lines, was appointed a member of the Committee on Direction to fill the vacancy caused by Mr. Hall's promotion. The total registration of railroad representatives at the meeting was about 170.

Report of Committee of Direction

The Committee of Direction felt that each railroad should assume the expenses of its representative in attendance at sessions of the Telegraph and Telephone division, other than those involved in attendance at committee meetings, which will be assumed by the American Railroad Association. In the event of an employee who is not a representative member being required to attend a meeting of a special committee on whose work he is engaged, a request for his attendance should be forwarded to the senior representative member of his road.

In order to clear up any misunderstanding concerning the question of membership of the division, methods of voting, etc., the Committee of Direction submitted several additional paragraphs to be added to the regulations of the division, the most important of which was as follows:

Representatives of members shall be those actively connected, in official or supervisory capacities, with railroad telegraph or telephone service, who have general charge of such service over an entire railroad or grand division of a railroad consisting of two or more transportation divisions. In addition, other officers and employees in like capacities and in service may be designated by the railroads as their representatives or may be called upon by the division for special duties.

The method of voting at meetings of the division was given consideration, and the Committee of Direction decided that it was not necessary to take any action upon the subject owing to the fact that representative members of the division can call for a vote by roll call (which is based upon the number of memberships held by each railroad in the association) upon any motion at a session of the division.

This committee has given consideration to the question of a manual of recommended practices, which is to be of the loose-leaf binder type and of convenient size, so that recommended practices may be issued from time to time as desired.

It was decided that two sessions of the division shall be held each year, one in the spring and one in the fall. The spring session for 1920 will be held in St. Louis on March 30 and 31 and April 1, and the fall meeting, which will be the annual meeting, will be held in Winnipeg on September

22, 23 and 24 unless some emergency arises which makes a change necessary.

Almost all of the discussion concerning the report of the Committee of Direction was based on the question of membership and the voting power of members. It was explained that each road supporting the American Railroad Association is a member of the Telegraph and Telephone division and therefore has a right to appoint representative members, consisting of any number of representatives it sees fit to select. Each representative member has a right to a vote on the floor, but when a disputed question arises a roll call vote is necessary; the ranking representative member of each road is the only one qualified to vote in accordance with the mileage of the road or roads he represents. The privilege of voting on letter ballot is restricted in the same manner. Affiliated members (those not in railroad service) have the right to vote in committees with which they may happen to be working. However, such members do not have the right to vote at division meetings in the adoption or rejection of matters presented at such meetings.

Maintenance and Construction of Pole Lines

Sub-Committee "A"—of Committee No. 1—Construction and Maintenance—Outside Plant, presented a report of progress in the revision of specifications for the Maintenance and Construction of Pole Lines, and it expects to present acceptable specifications at the next annual meeting. The report was accepted as information.

Wire Crossings

The report of Sub-Committee "B"—Wire Crossings, of Committee No. 1—Construction and Maintenance—Outside Plant, contained a synopsis of its activities since the meeting of the division held in Chicago in June, 1919. Since that date this committee held two separate meetings and one joint meeting for the purpose of arriving at a definite conclusion relative to the proposed revision of the National Electrical Safety Code, a portion of which deals with signal lines crossing over railways.

At the joint meeting, which was called by M. G. Lloyd of the Bureau of Standards, there were present, besides members of Committee "B," representatives of the Bureau of Standards, the American Electric Railway Engineering Association and three representatives of the railroad engineering departments, besides several wire-owning companies. At this meeting Sub-Committee "B" of the Telegraph and Telephone division advocated the changes recommended in its report submitted at the Chicago meeting in June. The Bureau of Standards asked the committee to endeavor to draft a clause which would allow weaker construction over some of the minor side tracks to take the place of the Rule, Signal Lines Crossing Over Unimportant Railroads, which appeared in an earlier revised Bureau of Standards Code and which the Telegraph and Telephone division persistently objected to; the committee taking the stand that there are no unimportant railroads. The Bureau of Standards also wished to get further opinions in regard to the use of No. 12 galvanized steel wire for spans 125 ft. long or less.

Sub-Committee "B" recommended that the Rule, Signal Lines Crossing Over Unimportant Railroads, be corrected to Signal Lines Crossings Over Minor Tracks (not including any main tracks), and that this rule should provide

for narrow gage tracks, tracks used only temporarily for construction purposes for a period not to exceed one year, tracks on which standard freight cars cannot, for physical reasons, be operated, street railway tracks on public highways and industrial spur tracks with not exceeding two tracks under the same span. Besides the above, other recommendations were submitted to the Bureau of Standards on rules and regulations to cover signal lines crossing over railways. The Bureau of Standards then presented its revisions to the Telegraph and Telephone division at its December meeting. The portion of the Bureau of Standards revised code on Signal Lines Crossing Over Railways, which received the greatest amount of discussion, reads as follows:

Signal lines crossing over tracks included in the following list shall conform to the requirements of Grade E:

1. Spurs not exceeding two tracks in the same span.
2. Branches on which no regular schedule of operation is maintained.
3. Narrow-gage tracks or other tracks on which standard rolling stock cannot, for physical reasons, be operated.
4. Tracks used only temporarily for construction or similar purposes for a period not exceeding one year.
5. Tracks not operated as a public utility, such as industrial railways used in logging, mining, etc.

In presenting this report E. C. Keenan, general superintendent telegraph and telephone Eastern region, United States Railroad Administration, said that the Bureau of Standards expected to publish a revised National Electrical Safety Code and that Sub-Committee "B" of the Telegraph and Telephone division was endeavoring to get the best possible form of construction for signal lines crossing over railways, that it could under the conditions and that it was necessary to grant several concessions to the Bureau of Standards if the matter was to be cleaned up in a satisfactory manner. Regarding the several items covering various classified tracks, Sub-Committee "B" recommended that the first two classifications be revised as follows:

Signal lines crossing over minor tracks included in the following list shall conform to requirements of Grade E:

1. Spurs less than 2,000 ft. long and not exceeding two tracks in the same span.
2. Branches on which no regular schedule of operation is maintained.

The committee recommended that item 2 be eliminated entirely because it felt there were many such branch lines which were as important as main lines. Items 3, 4 and 5 were considered satisfactory as presented.

William Bennett (C. & N. W.) stated that he believed the entire matter was based on the wrong principle. He objected to the methods used for determining the classification of standard gage steam railroad industry or spur tracks as minor by the number of tracks under a span of wires. He stated that the proper method required a primary consideration of the exposure of persons to risk and injury. He further said that a very large part of the deaths and injuries of railroad employees engaged in transportation occur upon minor tracks, called industry and yard tracks, and that electrical conductors crossing over such tracks in many cases are attached to buildings and structures of various kinds other than poles. Industry tracks are largely composed of curves of unusually short radii, which are introduced to avoid objects which cannot be removed to permit tangent alignment. These objects constitute obstructions to the view of railroad employees engaged in switching cars, and because of these conditions employees are obliged to ride upon side ladders and roofs much more frequently and under more hazardous circumstances than when engaged in work upon ordinary yard and main tracks, this greater exposure being necessary to permit them to occupy positions from which their manual signals can be seen. He there-

fore believed that it was extremely important that extra care should be taken to avoid scant lateral and vertical clearances between electrical conductors and their supports and standard freight cars, and that ample strength should be provided in the conductors and their attachments and supports at crossings over such minor tracks.

E. C. Keenan stated that Grade "E" construction was one-third weaker in crossing span supports than Grade "D," the requirement over main line crossings, and that the proposed construction is the strongest the A. R. A. can secure from the Bureau of Standards. Sub-Committee "B" was instructed to continue its work on the balance of the revised National Electrical Safety Code submitted by the Bureau of Standards and to recommend the necessary changes it felt would be agreeable to the division, so that the Bureau of Standards would have the advantage of such recommendations in preparing its final draft of the code, which it expects to complete within a short time.

Underground Construction and Transportation

Sub-Committee "C"—Underground Construction, Committee No. 1, Construction and Maintenance, Outside Plant, submitted specifications for conduit castings, creosoted wood conduit and plank, fibre conduit, pulling-in iron, steel pipe conduit and for vitrified clay conduit.

The committee found that the Signal division of the A. R. A. already had prepared certain specifications which meet the requirements, and these, with similar specifications of telegraph and other companies, were embodied in the specifications mentioned above. Each of these specifications was submitted to the division for its approval, and is to be submitted to letter ballot for inclusion in the manual. After brief discussion each specification was approved.

Sub-Committee "D" Transpositions, Committee No. 1, Construction and Maintenance—Outside Plant, submitted complete a specification for locating and installing transpositions in telephone circuits. This specification is practically the same as that presented at the June meeting of the division, only a few minor changes being made by the committee, based on comments received since the June meeting. The Sub-Committee also submitted specifications for the line materials referred to in the specifications, these being complete manufacturing specifications which can be used in purchasing and inspecting the materials required for transposition in telephone circuits.

W. Roger, telegraph and telephone engineer, Southwestern region, United States Railroad Administration, stated that a very heavy line between St. Louis and Kansas City, with transposition such as shown in the plans, has proved very successful. After a brief discussion of the various specifications they were accepted by the division, to be submitted to letter ballot for approval.

Committee No. 2—Construction and Maintenance—Inside Plant, submitted specification for the installation of telegraph and telephone equipment in railroad offices. A draft of the specification was submitted to the division at its Chicago meeting in June, at which meeting recommendations were offered, and the committee was instructed to proceed with the development of the specification after receiving written comments and criticisms from the members. Its report at the December meeting included the preliminary draft, together with the revised draft. After brief discussion the report was accepted as information and progress.

Report on Electrolysis and Lightning Protection

Committee No. 3—Protection Against Electrolysis, made no detailed report on the subject of protection against electrolysis, as its report presented at the June meeting, which was accepted as information, was later adopted for in-

clusion in the manual. This committee's present work is to keep in touch with electrolysis in general and be prepared to make any recommendations that may seem necessary, so as to keep the instructions which have already been adopted up-to-date.

Committee No. 4—Protection Against Lightning or Electric Light and Power Circuits, submitted a preliminary draft and specifications for such protection. E. C. Keenan objected to any separation of the wires and apparatus owned by railroads from that not owned by the railroads. He believed that from the standpoint of the protection of life and property there should be no separation of the wires and that any clauses so separating such wires and apparatus should be eliminated.

H. W. Drake, apparatus engineer, Western Union Telegraph Company, said he believed in practical methods, and wondered if any one could imagine that the telegraph and telephone companies would attempt to put in apparatus which would introduce a hazard to lives and property. He further stated that it would be almost impractical to expect a complete and thorough inspection of installations for the purpose of determining whether each and every wire, of which there are great quantities entering railway buildings, had the protection such as might be specified in the division specifications. He said that protective apparatus designed for commercial company purposes may necessarily have to be different for the protection of its apparatus than that required for protecting the apparatus on railroad circuits.

The committee's report, with the exception of the specification for line fuses, was accepted for submission to letter ballot for inclusion in the manual after necessary corrections were made in the matter of what constitutes approved methods.

Committee No. 5—Telegraph and Telephone Development, presented a report upon a number of recent improvements, which was accepted as information.

Message Traffic

Committee No. 6—Message Traffic—submitted recommended practices for traingram service, the education covering the proper use of traingram facilities, of the examination of telegraph operators on switchboard manipulation and a program of future work to be undertaken by the committee. The committee recommended that traingram service shall be under the control of the telegraph department, the baggage department and other departments co-operating to maintain prompt and efficient service between offices, stations and trains. Where there is a large volume of business to be handled by traingrams between designated points daily it may be found advantageous to provide small leather or canvas pouches with proper tags for this service. Where the business does not justify this, envelopes should be used; two envelopes of light green color being provided, one 3½ in. by 6½ in. and the other 4¼ in. by 9½ in., with traingrams printed blank, 8½ in. by 5½ in., of light green color to correspond with the envelopes.

A member of the telegraph office staff, especially assigned, should make a record of traingrams, placing a copy of this record in the envelope with the traingrams and retaining one copy in the telegraph office file; address envelopes to the representative of the telegraph department at destination and see that traingrams are delivered to the station or train baggageman, who will give this class of mail special attention.

Train baggagemen will keep traingrams in packages separate from other mail and will stamp on the envelope the date and the train handled. The representative of the telegraph department at divisional and relay offices should have a clerk or messenger meet passenger trains, obtain

traingrams and deliver them to the telegraph office, where they will be checked, their receipt acknowledged by wire by giving the sheet number accompanying the traingrams and delivery made in the same manner as telegrams. If any traingrams are missing from the package the originating office shall be advised.

The question was raised as to why green traingrams and envelopes were recommended in place of the pink, which on some roads has become common practice. E. L. King, superintendent telegraph, Southern Pacific, explained that green was recommended because it was desired to establish a standard to be used throughout the country. It was further explained that green was chosen because it was found to be less expensive than other colors.

G. A. Cellar, superintendent telegraph, Pennsylvania Lines West, inquired whether all traingram service was to be handled through the telegraph office, and if so if such service at way stations was to be handled by the operator. In such an event he concluded that traingram service might become very complicated. Mr. King explained that the committee did not advocate that, stating that the more elaborate system was to be used only for large offices.

A number of the members were in favor of the system which provided that the various departments traingram their own department. H. Hulatt, manager of telegraphs, Grand Trunk System, stated that many offices did not trust traingram service, so that it was the desire of the committee to establish a system which could be relied upon so that they would have confidence in the service.

E. C. Keenan said that traingram service had been in use on the New York Central for about 30 years to his knowledge and that various schemes had been tried out from time to time under the supervision of the telegraph office. He stated that the results proved that it was necessary to eliminate the red tape and that he believed the originator of the message should handle and send it out. It is now the practice to send traingrams direct from the originating office to the baggage department. He said it resolved itself into a question of supervision and that he believed that traingrams should not be used promiscuously.

After considerable discussion the committee moved that that portion of the report be accepted by the division. Mr. Keenan offered a substitute motion to the effect that the recommended practice relative to handling of traingrams be further considered by the committee; that it should obtain the views of the members of the division in writing as to their methods of handling traingrams, especially as to whether this service should be handled by the originator of the message or sent to the telegraph office for handling, and after receiving such information the committee draft its recommendations for submission to the division. After a ballot vote the substituted motion carried.

Inductive Interference

Committee No. 7—Inductive Interference, which is a new committee, submitted preliminary information on inductive interference to telegraph and telephone lines due to various causes. High tension lines throughout the country are rapidly increasing, so that it is important that the telegraph department should have the benefit of such studies as have been made. This committee presented exhibits made up in part from papers by H. S. Waren, presented before the American Institute of Electrical Engineers in April, 1918; by P. J. Howe at the St. Louis meeting of the Railroad Telegraph Superintendents in May, 1913; on "Toll Telephone Practice" by Thiess and Joy, edited by F. F. Fowle; also General Order No. 52 of the Railroad Commission of the State of California. After a brief discussion this report was accepted as information.

Increased Wages Consumed 97 Per Cent of Increased Rates

INCREASES in freight and passenger rates made during federal control amounted to \$1,835,000,000 when applied to the traffic moved up to July 31, 1919, while the increases in wages applied to the number of employees and the hours or days worked in July, 1919, amounted to \$1,774,800,000, or 97 per cent of the revenue from the increased rates, according to a statement compiled by the Interstate Commerce Commission at the request of Senator E. D. Smith of South Carolina and presented by him in the Senate on December 20. Senator Smith also asked to have a large amount of more detailed statistics on the subject printed as a Senate document. A part of the commission's statement as presented to the Senate is as follows:

While the statistics of revenues and expenses are available for October, 1919, the wage data are available only as late as July, and it is necessary to put all steps in the following series of computations on the same basis.

I. The volume of traffic under federal control up to and including the month of July, 1919, was as follows:

CLASS I ROADS ONLY		
	Ton-miles of revenue freight	Passengers carried 1 mile
Year ending December 31, 1918.....	398,442,020,000	42,566,343,000
Seven months ending July 31, 1919.....	196,289,549,000	25,856,377,000
Total	594,731,569,000	68,422,720,000

II. The average revenue per ton-mile and per passenger-mile at the rates prevailing in 1917, before federal control, and in 1919, after the rate increases coming into effect subsequently, were as follows:

	Calendar year 1917	First seven months of 1919	Increase
Revenue per ton-mile.....mills	7.15	9.73	2.58
Revenue per passenger per mile.....cents	2.09	2.53	.44

III. Applying the increases shown under paragraph II, we get the following approximation of the increase in money which would have been paid by the public on the traffic of 19 months if the higher rates now enjoyed by the Railroad Administration, as compared with those prevailing in the calendar year 1917, the last year of private control, had been in effect from January 1, 1918:

Increased freight revenue.....	\$1,534,000,000
Increased passenger revenue.....	301,000,000
Total	\$1,835,000,000

IV. The aggregate time worked by employees of Class I railroads during federal control, from January 1, 1918, to July 31, 1919, was as follows:

	Calendar year 1918	First seven months of 1919
Reported on hourly basis, hours.....	4,950,985,160	2,499,458,577
Total	7,450,443,737	
Reported on daily basis, days.....	71,534,214	41,494,450
Total	113,028,664	

V. The average rates of pay per hour and per day for the year 1917 and in July, 1919, the latest month available, were as follows:

	Year ended December 31, 1917	Month of July, 1919	Increase
Reported on hourly basis.....per hour	\$0.318	\$0.532	\$0.214
Reported on daily basis.....per day	3.334	4.989	1.596

VI. Applying these increases, we get an increased compensation on the aggregate time above shown as follows:

Reported on an hourly basis.....	\$1,594,400,000
Reported on a daily basis.....	180,400,000
Total	\$1,774,800,000

This takes account not only of the increased rate per hour, but also of the additional men required because of the shorter working day.

VII. Comparing the increase represented by the freight rates and passenger fares, under paragraph III above, with

the increase due to increased basis of compensation and reduction in hours per day, we have the following:

Payable by public.....	\$1,835,000,000
Received by labor, or 97 per cent.....	1,775,000,000

The balance would be absorbed by increased prices of materials.

It should be noted that the higher basis of freight rates and passenger fares shown above was not actually operative during the whole period of federal control nor was the wage basis of 1919 actually used during the whole period of federal control.

VIII. The number of freight cars and their average capacity is shown by the following table:

Date	Number of freight cars	Average capacity (tons)
June 30, 1915.....	2,341,567	39.7
June 30, 1916.....	2,313,378	40.5
December 31, 1916.....	2,359,475	40.9
December 31, 1917.....	2,379,472	41.5
December 31, 1918.....	2,380,879	41.5

IX. The ton-miles and passenger-miles in the last two years under private control compared with the two years of federal control are as follows, for a mileage corresponding to Class I roads under federal control:

Year ended—	Ton-miles	Passenger-miles
December 31, 1916.....	360,751,781,794	34,502,599,882
December 31, 1917.....	392,623,247,073	39,381,719,320
Total	753,375,028,867	73,884,319,202
December 31, 1918.....	398,442,019,620	42,566,342,892
December 31, 1919.....	366,303,547,875	44,788,784,401
Total	764,750,567,495	87,355,127,293

Per cent of increase, 1918 and 1919 over 1916 and 1917.....	1.5	18.2
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The ton-miles are based on the revenue and nonrevenue ton-miles shown in the operating reports issued by the Railroad Administration. The nonrevenue ton-miles have been excluded on a percentage basis. In completing the year 1919 and 1918 figures have been used for the months for which 1919 data are lacking, namely, November and December as to ton-miles, and October, November and December as to passenger-miles. The 1916 and 1917 figures published by the Interstate Commerce Commission have been slightly reduced to bring them to a basis comparable with the mileage of Class I roads under federal control.

X. The railway operating revenues, expenses, and railway operating income during and since the test period may be summarized as follows:

Year	Railway operating revenues	Railway operating expenses	Operating income as defined under the Federal control act
Three years ending June 30, 1917	\$3,374,030,692	\$2,280,653,433	\$996,524,492
Year ended December 31, 1917	4,010,463,579	2,858,212,210	974,778,937
Year ended December 31, 1918	4,913,319,604	4,006,894,762	690,418,778
Ten months of 1919.....	4,292,802,493	3,615,440,558	481,082,531

XI. Statement as to various wage increases. This information is given in a separate statement which is being prepared by the Railroad Administration.

XII. Prices of railway materials. The following data from the Federal Reserve Bulletin for October, 1919, are illustrative:

Year and month	Coal, bituminous, run of mine		Steel rails, open hearth, Pittsburgh	
	Average price per short ton	Relative price	Average price per short ton	Relative price
July, 1914	\$2.20	100	\$30	100
August, 1914.....	2.20	100	30	100
1915.....	2.20	100	30	100
1916.....	2.20	100	35	117
1917.....	4.40	200	40	133
1918.....	4.10	186	57	190
1919.....	4.00	182	47	157

AN AERODROME is to be constructed at Goregaon, Bombay, by the Government of India. The area of land purchased for this purpose is 300,000 square yards.

Laboratory Tests on Holding Power of Track Spikes

Some Screw and Cut Spikes Are Subjected to Comparison with an Entirely New Type of Fastening

A SERIES OF TESTS was recently conducted in the Civil Engineering Testing Laboratories of Columbia University for the purpose of comparing the holding power of a new form of track spike with that developed by the ordinary cut spike and the screw spike. These tests were reported by Albin H. Beyer and William J. Krefeld in Bulletin No. 1 of these laboratories, which presents some interesting facts for the consideration of engineers of track and other railway officers concerned with track maintenance.

The new spike is known as the Sessler Grip spike, manufactured by the American Spike Company of New York.

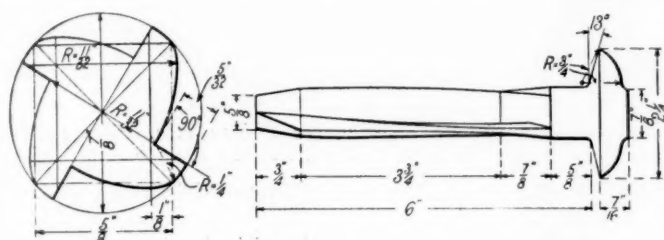


Fig. 1. Details of the Sessler Grip Spike

As shown in Fig. 1, this spike has a round shank with grooves in it and a round head not unlike that of a screw spike with the nut portion removed. The grooves in the shank, which are of a peculiar shape, as shown in the cross section on the illustration, have a slight twist, so that the spike revolves slightly in driving and drawing. The spike is driven in a manner similar to the ordinary cut spike.

The following is an abstract from the laboratories' bulletin:

The spikes were investigated for resistance to direct pull and resistance to direct pull as affected by re-driving. The spikes tested were: (a) A chisel-pointed cut spike furnished by the Pennsylvania Lines with a shank 6 in. long and 21/32 in. square in section, the average weight being 0.81 lb. per spike; (b) a standard screw spike submitted by the Delaware, Lackawanna & Western with an average weight of 1.31 lb.; (c) the Sessler spike, which had an average weight of 1.1 lb. per spike.

The ties used in these tests were furnished by the various railroads and represent average quality. They included untreated chestnut, and white oak ties sawed on two sides, an untreated white oak hewn tie, untreated Douglas fir ties sawed on four sides and creosoted yellow pine ties sawed on two sides.

The pulling tests made to determine the holding power of the three kinds of spikes were conducted under the following conditions:

- 4 Pennsylvania cut spikes driven 5 1/2 in. without bored hole;
- 4 Pennsylvania cut spikes driven 5 1/2 in. into 1/2 in. bored hole;
- 4 D. L. & W. screw spikes screwed 6 in. into 5/8-in. hole;
- 4 D. L. & W. screw spikes driven 6 in. into 5/8-in. hole;
- 4 Sessler Grip spikes driven 5 1/2 in. without bored hole;
- 4 Sessler Grip spikes driven 5 1/2 in. into 7/16-in. bored hole.

All cut and Sessler Grip spikes were driven by a man inexperienced in track work. The screw spikes were inserted in accordance with the personal instructions of W. L. Madill, roadmaster on the Lackawanna at Hoboken, N. J. One set of screw spikes in each kind of tie was driven for the full 6-in. depth to determine also the effect upon the holding power of driving as compared with the standard method of screwing the spike in.

All tests were made in the civil engineering testing laboratory at Columbia University. The tie, with the spikes to be tested facing downward, rested upon two steel blocks upon the upper head of a 100,000-lb. Riehle testing machine. The spike was gripped by means of a special holder forged in the form of a closed yoke and provided with a slot of width sufficient to engage the shank of the spike below the head. The same holder was used for the screw and Sessler Grip spikes as they had the same sized shank under the head. The holder used for the cut spike was similar except for the slot, which was slightly narrower. The load, therefore, was applied to the spike head at two points directly opposite each other, thus tending to insure an axial pull. The lower ends, or shanks, of these holders were held by the pin of a shackle, which was in turn held by a yoke gripped by the wedges in the lower head of the testing machine. Deformation measurements were made in a number of ways to insure a degree of accuracy commensurate with the purpose for which the measurements were to be used.

For purposes of comparison the resistance of the spikes as they were pulled were tabulated for definite amounts of withdrawals, and these were used for the plotting of curves, of which the one in Fig. 2 is typical, except that in cases where the screw spikes were driven all or part way, instead of being screwed into place, the holding power was not nearly

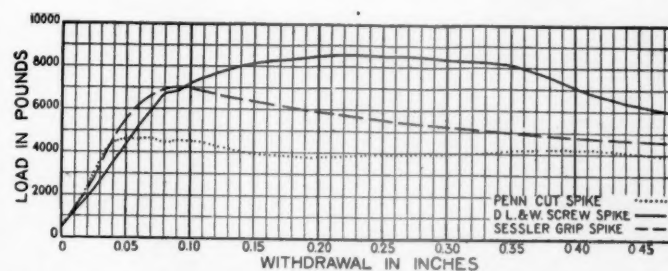


Fig. 2. Direct Pull Test in a Treated Yellow Pine Tie

so large. In the case of white oak ties the resistance obtained for all of the spikes was much greater than in yellow pine, reaching about 12,000 lb. for the Sessler spikes and 16,000 lb. for the screw spikes. One phenomenon of these tests, as illustrated in Fig. 1, is that, within the limits within which the withdrawal is approximately proportional to the load, the withdrawal for both the cut spike and the Sessler spike is proportionately less for a given load than it is for the screw spike.

Redrive and Pulling Tests

In accordance with the suggestion made by the engineers of several Eastern railroads, redrive and pulling tests were made to determine the effect of the successive re-driving of a

spike after having been withdrawn 0.25 in. It is believed that such tests will give some information as to the influence upon the holding power of the spike when redriven after having been lifted in service. Six such tests were made for each type of spike in each of the four kinds of ties.

The method of testing was similar to that in the direct pulling tests, except that the spikes were withdrawn only $\frac{1}{4}$ in. The cut spike and the Sessler Grip spike were then redriven, and the screw spike reserved the full amount of the withdrawal in all cases. The spikes were then repulled $\frac{1}{4}$ in., redriven or rescrewed, respectively, and again repulled $\frac{1}{4}$ in.

The results obtained from these redriving and repulling tests were computed and plotted in the same way as those for the straight pulling tests and in the same manner. Fig. 3 shows an example of the curves obtained in these repulling tests for the spikes in an untreated white oak tie. These curves show higher values by over 100 per cent than those obtained in the treated yellow pine ties and also evidence a considerably greater difference between the screw spike and the Sessler spike than was obtained in the case of the pine ties.

Relative Ultimate Holding Power

The relative ultimate holding powers of the three types of spikes tested expressed in terms of the cut spike driven without a hole for the various ties is as follows:

Tie	Method of driving	Cut	Screw*	Sessler grip
Chestnut	Without hole	100 %		139.5 %
	With hole	95.2 %	176.6 %	118.5 %
Creosoted yellow pine...	Without hole	100 %		142.1 %
	With hole	96.9 %	175.2 %	134.1 %
White oak.....	Without hole	100 %		114.3 %
	With hole	97.6 %	172.7 %	130.8 %
Douglas fir.....	Without hole	100 %		121.4 %
	With hole	82.7 %	167.4 %	107.5 %
Average, all woods.....	Without hole	100 %		129.3 %
	With hole	93.1 %	172.9 %	122.7 %

*Screw spike screwed full depth.

These results appear to indicate that both the cut and the Sessler Grip spike develop a slightly higher initial resist-

the wood fibers and the surface of the spike is sufficient.

A cut spike driven into a tie without first pre-forming the hole crushes and bunches the fibers over a wide area, due largely to the splitting and wedging action being confined to one plane. With the Sessler grip spike, this splitting action appears to be less, due partly to the shape of the point tending to produce a combined cutting and splitting action, but much more to the rotation of the spike on driving, averaging 63 deg. when driven without a hole and 68 deg. when driven into a hole. The crushing and bunching of the

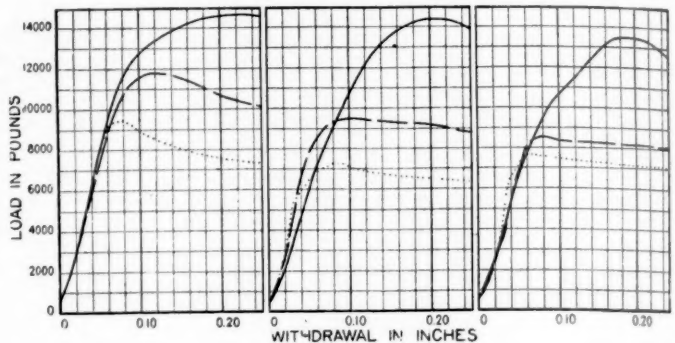


Fig. 3. Re-pulling Test in an Untreated White Oak Tie

wood fibers can be materially reduced both with the cut spike and the Sessler grip spike by pre-forming the hole, as shown in Fig. 4.

Elasticity of a Spike Fastening

When a spike is driven into a tie the fibers of the wood are forced downward and pressed simultaneously outward. When such a spike fastening is subjected to a direct pull, within its elastic range, the friction between the wood fibers and the surface of the spike tends to hold it in place, and



Fig. 4. How Pre-Bored Holes Reduce the Injury Caused by Spike Driving

ance to withdrawal when driven without a pre-bored hole than when driven into $\frac{1}{2}$ -in. and $\frac{7}{16}$ -in. holes, respectively. This increase in initial holding power secured when a spike of this type is driven without pre-forming the hole is of doubtful value; for the efficiency and ultimate life of a spike in a tie depends not so much upon the ultimate initial resistance to withdrawal as it does upon the range of elastic behavior of the wood fibers, provided the friction between

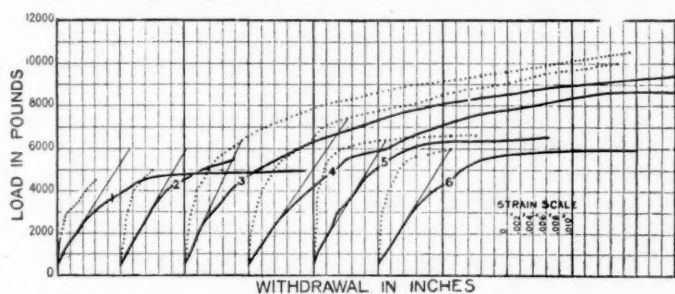
whatever yielding does take place is due solely to the elastic distortion of the wood fibers. The elastic withdrawal limit of a spike fastening is reached either when the wood fibers in contact with the surface of the spike are strained beyond their elastic limit, or the bond or adhesion between the fibers of wood and the surface of the spike is insufficient to prevent relative motion between the two. Both in the cut and Sessler Grip spike failures appear to take place simul-

taneously in the two ways just described. In the screw spike, on the other hand, failure is more gradual, but incipient failure takes place at very low loads, probably due to the crushing of the fibers against the thread of the screw.

Within the elastic withdrawal limit the resistance to direct pull developed by a spike is directly proportional to the displacement of the spike in the wood. Also within the elastic withdrawal range the permanent set is practically negligible.

When the load upon a spike exceeds its elastic withdrawal limit, sliding friction comes more and more into play and the permanent sets become appreciable. The ultimate resistance to withdrawal that is actually developed by a spike depends somewhat upon the elastic strength of the wood fibers, but much more upon the friction of the bunched and distorted fibers upon each other and the surface of the spike; the amount of friction varies in very wide limits even in the same tie, especially in the cut spike, this friction varies suddenly and irregularly with the amount of withdrawal, giving the load strain curve a saw-tooth appearance.

To be a permanent rail fastening, a spike must not be loaded in excess of its elastic withdrawal resistance, irrespective of its ultimate resistance. A rail fastening should, therefore, be designed with a sufficient number of spikes, so that the load per spike does not exceed the elastic withdrawal



1 and 2—Cut Spike, 3 and 4—Screw Spike, 5 and 6—Sessler Spike. Full Line Is Strain Curve, Dotted Line Is Set Curve.

Fig. 5. Relation Between Applied Load and Corresponding Withdrawal and Set

resistance of any spike. It is obvious that the least number of spikes and greatest efficiency per rail fastening will be obtained with that type of spike having the highest elastic withdrawal resistance. A proper safety factor should also be introduced in the design to allow for any possible lowering of the elastic withdrawal resistance resulting from the fatigue and physical deterioration of the wood fibres with time.

The true elastic withdrawal limits can be only approximately determined from the load stress curves, as the inaccuracies of measurements introduced by the compression of the tie on the bearing blocks and the twisting, especially of a more or less warped tie, have in some cases modified the curves. This is especially true in the case of the screw spike, which requires the most sensitive instruments to locate the point of incipient failure. For these reasons only general conclusions can be drawn from these tests as to the actual and relative elastic withdrawal resistances of the three types of spikes under the various conditions tested.

To determine the true elastic behavior of the three types of spikes a limited number of tests were made, in which the withdrawal of the spike was measured directly to the nearest 1-10,000 part of an inch. In this investigation a creosoted yellow pine tie was used and two spikes of each type were tested, using prebored holes.

Based upon the results of these tests, the relative average elastic limits, taking the cut spike at 100 per cent, is:

Cut spike	100 per cent	
Screw spike	90 per cent	elastic limit in bearing
Sessler Grip spike	129 per cent	final yield point

To determine the true elastic behavior of three kinds of spikes, a limited number of tests were made, in which the withdrawal of spikes was measured directly to the nearest one ten-thousandth part of an inch. In this investigation a creosoted yellow pine tie was used and two spikes of each type were tested, using pre-boring the holes. The results of these tests are given in Fig. 5. Based on these results, the relative average elastic limit, taking the cut spike as 100 per cent, is 90 per cent for the elastic limit in bearing of the screw spike, 178 for the final yield point of the screw spike, and 129 per cent for the Sessler spike.

The behavior of the screw spike, as already mentioned, is somewhat peculiar; at about 2,700 lb. the true elastic limit is reached, evidently due to a bearing failure of the thread upon the wood, represented by the lower percentage in the above table. From this point up to about 5,000 lb. the load strain curve is still substantially straight, but slightly more inclined. At this upper limit, represented by the higher value in the above statement, there is a decided change in direction, increasing rapidly with the load, practically a yield point. Because of the limited extent of this investigation, covering two spikes of each kind in one tie only, the results cannot be considered conclusive and require further verification.

General Conclusions

1. The tests outlined herein, although of limited extent, show conclusively that the rail fastenings tested act as elastic structures within certain limits, depending upon the character of the wood and type of spike.

2. In the softer woods the elastic limit of the fastening is reached at very small withdrawals, ranging from 0.004 to 0.006 in. In an oak tie these limits appear to be somewhat higher.

3. Within the elastic range of the fastening the resistance developed by the fastening is directly proportional to the amount of withdrawal.

4. Small permanent withdrawals or sets have been recorded within the elastic range of the rail fastening, but these are no greater than would be reasonably expected in a material such as wood.

5. A rail fastening to approach permanency must at no time be stressed beyond its elastic holding power, making due allowances for the fatigue and physical deterioration of the wood fibers during the life of the fastening.

6. In view of the importance of these facts to the railway profession, a more complete investigation should be made to definitely establish the elastic behavior of various types of spikes, both without and with preformed holes of various sizes driven into ties of various stages of deterioration.



Photo from International Film Service

The Bagdad Railway Under British Control. Turkish Prisoners on Their Way to Prison Camp

Say Farmers Oppose Government Ownership of Railroads

ASSERTIONS that the farmers of the United States favor government ownership or operation of the railroads, which are frequently circulated by the labor organizations and by Benjamin C. Marsh, secretary of one of the farmers' organizations, are denied in a letter addressed to President Wilson by Thomas C. Atkeson, Washington representative of the National Grange, which claims a membership of more than 1,000,000 farmers, and also by representatives of other farm organizations, quoted in an article in the Washington Star of December 21 by William Harrison Moore.

In a letter to President Wilson, Professor Atkeson sets forth the resolution adopted by the National Grange urging the return of railroads to private ownership. Professor Atkeson states that it is his belief that "a large majority of the farmers of the nation believe that government operation of all railroads should cease at the earliest possible moment."

"It is also my belief," he says, "that persons who have sought recently to give currency to statements that organized farmers favored government ownership are not farmers themselves and do not represent any considerable proportion of the men or women actually engaged in farming. In this belief I am strengthened by the fact that the agricultural press, with few and inconspicuous exceptions, oppose government ownership, and continuation of government operation, and the leaders of the great agricultural organizations other than the National Grange are unanimous in opposition to government ownership."

Professor Atkeson, in discussing the question of how many farmers are actually in favor of government control of railroads or the Plumb plan, said that less than 5 per cent of the agriculturists in America believe in government ownership.

"Articles appearing in the press of the country last week gave prominence to the visit of a delegation of 27 men to the White House to protest against the return of railroads to the owners for a period of at least two years," said Professor Atkeson. "This delegation, the newspapers stated, was 'composed of representatives of union labor and farmers' organizations.' Now, this is a fallacy. There was a large number of union labor men present, all right, but only two men claimed to represent the 'farmers of the country.' These men are George P. Hampton and Benjamin C. Marsh. They claim to represent the Farmers' National Headquarters. Hampton is in charge, and Marsh is his assistant."

"The delegation which waited upon the President—they were greeted by Mr. Tumulty, by the way—sang loud praises of government ownership, according to the newspaper reports. A letter to Mr. Wilson, setting forth in one part how strong the farmers of the country were for government ownership, and how bitter was their opposition to the Cummins railroad bill, made interesting reading."

"But the letter had the facts wrong. The truth of the matter is, these so-called farmers' delegates did not represent the great mass of American farmers. I doubt if they represent 150,000 farmers in the entire country. The great farmers' organizations are for the most part heartily in favor of the Cummins railroad bill and bitterly opposed to the government retention of railroads."

That Hampton and Marsh of the farmers' national headquarters "faithfully represent some farmers with radical tendencies in the western states" is the opinion expressed by Charles A. Lyman, secretary of the National Board of Farm Organizations."

Mr. Lyman said that while Hampton and Marsh have lined up the American Society of Equity, containing perhaps

40,000 farmers of Wisconsin, Minnesota, Iowa and North Dakota, and a couple of other farmers' protective societies, the total number of farmers represented by these men will not exceed 200,000.

The majority of members of the National Board of Farm Organizations, Mr. Lyman said, are heartily opposed to government ownership and favor the return of the railroads to their owners.

A. M. Loomis, assistant to Professor Atkeson, pointed out that at the fifty-third annual session of the National Grange, held November 12 at Grand Rapids, Mich., the organization without a dissenting voice, went on record as being unalterably opposed to government control. The resolution on nationalization, adopted at the meeting, reads in part as follows:

"We declare our opposition to government ownership and to nationalization of business and industry unless clearly required in the public interest. We favor the safeguarding and protection of every right of private property on the broad ground that only by the full development of the right of private property can there be perpetuated the full measure of individual initiative and emulation upon which a democracy is based and by which its future is assured."

On the same day this resolution was adopted, Mr. Loomis said, the American Farm Bureau in Chicago also voiced its opposition to federal ownership. The same week the state committees of agriculture met in Chicago and adopted a similar resolution.

Early in November the National Farmers' Congress, composed of "steady, clear-thinking delegates," named by the governors of the various states, met at Hagerstown, Md., and went on record as being opposed to government ownership.

In the face of this opposition to government ownership, according to Mr. Loomis, the letter to President Wilson made it appear that the farmers were "all keen for this business of government control, and the newspapers naturally played up the fact."

In the address of Oliver Wilson, master of the National Grange, delivered at the annual meeting, the following was stated:

"One of the imperative necessities of today is the putting of emphasis upon the sacred rights of property, as opposed to the wild orgies of radicalism, nationalization and anarchy, which are sweeping the land and threatening to destroy every industry, every farm and every home."

On December 16 Professor Atkeson dispatched a letter to Senator Cummins urging prompt action by the Senate in turning back to the owners the railroads of the country and enacting proper legislation for this purpose.

Orders of Regional Directors

INSPECTION AND MARKING OF COTTON.—Supplement 1 to Circular 235 of the Southwestern regional director amends Section 3 of the original order so that compressed cotton properly covered with bagging and which is to be further compressed for high density within the territory governed by these rules, may be accepted without patches, provided that in addition to the shipping marks, there is attached to each bale a waterproof shipping tag showing the name of shipper, point of origin, consignee and destination, and provided further that the shipper shows on his bill of lading "Cotton to be compressed to high density at" Section 7 is also amended so that cotton linters, which have been compressed before delivery to the carriers, in carload lots of not less than 75 bales consigned from one consignor to one consignee, upon which a carload rate is applicable, may be received without being tagged.

Wage Agreement for the Shop Employees

For First Time Railroads of This Country Have Entered Into
National Agreement With Shopmen

DIRECTOR GENERAL HINES entered into the following agreement, effective October 20, with the shop employees on roads under federal operation, represented by the Railway Employees' Department of the American Federation of Labor and its affiliated organizations of the Mechanical Section and Divisions Nos. 1, 2 and 3, thereof, including the International Association of Machinists, International Brotherhood of Boilermakers, Iron Ship Builders and Helpers of America, International Brotherhood of Blacksmiths and Helpers, Amalgamated Sheet Metal Workers' International Alliance, International Brotherhood of Electrical Workers, and the Brotherhood Railway Carmen of America.

It is understood that this agreement shall apply to those who perform the work specified in this agreement in the maintenance of equipment, maintenance of way, signal maintenance (except electricians engaged in signal maintenance, telegraph maintenance and all other departments of all railroads in federal operation, shop employees of American Railway Express, and Pullman Car Line employees having the same working conditions as specified in Supplement No. 4 to General Order No. 27. It is understood that this agreement does not annul agreements already in effect with other organizations unless and until a majority of the employees concerned express a desire for a change.

GENERAL RULES

Hours of Service.—Rule 1. Eight hours shall constitute a day's work. All employees coming under the provisions of this schedule, except as provided for in Rule 15, shall be paid on the hourly basis.

Rule 2. When one shift is employed, the starting time shall be not earlier than 7 o'clock, and not later than 8 o'clock. The time and length of the lunch period shall be subject to mutual agreement.

Rule 3. Where two shifts are employed, the starting time of the first shift shall be governed by Rule 2, and the second shift shall start immediately following the first shift, or at 8 p. m. The spread of the second shift shall consist of eight consecutive hours, including an allowance of 20 minutes for lunch within the limits of the fifth hour.

Rule 4. Where three shifts are employed, the starting time of the first shift shall be governed by Rule 2, and the starting time for each following shift shall be regulated accordingly. The spread of each shift shall consist of eight consecutive hours, including an allowance of 20 minutes for lunch within the limits of the fifth hour.

Rule 5. The time established for commencing and quitting work for all men on each shift shall be the same at the respective points, but where three shifts are worked by running repair forces, and two shifts by back shop forces, the quitting time of the first shift and the commencing and quitting time of the second shift of the back shop forces will be governed by the provisions of Rule 3.

Exception.—It is agreed that three eight hour shifts may be established under the provisions of Rule 4, for the employees necessary to the continuous operation of power houses, millwright gangs, heat treating plants, train yard running repair and inspection forces (not repair tracks) without extending the provisions of Rule 4 to the balance of the shop forces.

Rule 6. All overtime, except as the provisions of Rules 7, 9, 10 and 15 apply, outside of bulletin hours, up to and including the sixteenth hour of service in any one 24-hour period, computed from the starting time of the employee's regular shift, shall be paid for at the rate of time and one-half and thereafter at the rate of double time, up to the starting time of the employee's regular shift. This to include work performed on Sundays, New Year's Day, Washington's Birthday, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas and such state holidays as are now recognized as punitive overtime days at the various points on the respective railroads within the different states.

Rule 7. For continuous service after regular working hours, employees will be paid one hour for forty minutes' service or less, and shall not be required to work more than one hour without being permitted to go to meals. Employees called or required to return to work will be allowed five hours for three hours and twenty minutes' service or less. They shall be required to do only such work as held or called for.

Rule 8. Employees regularly assigned to work on Sundays or holidays, or those called to take the place of such employees, will be allowed to complete the balance of the day unless released at their own request. Those who are called will be advised as soon as possible after vacancies become known.

Rule 9. Employees required to work during lunch period shall receive pay for one hour straight time and be allowed necessary time to procure lunch without loss of time. This does not apply where employees are allowed the twenty minutes for lunch without deduction therefor.

Rule 10. Employees, except as the provisions of Rules 12 and 15 apply,

sent out on the road for emergency service, shall receive continuous time from the time called until their return as follows:

Overtime Emergency Service Road Work.—Overtime rates for all overtime hours and straight time for the recognized straight time hours at home station, whether working, waiting or traveling, except that after the first 24 hours, if relieved from duty and permitted to go to bed for five or more hours, they will not be allowed time for such hours, provided that in no case shall an employee be paid for less than eight hours on week days, and eight hours at one and one-half time for Sundays and recognized holidays, for each calendar day. Where meals and lodging are not provided by the railroad, actual expenses will be allowed. Employees will receive all allowances for expenses not later than the time when they are paid for the service rendered. Employees will be called as nearly as possible, one hour before leaving time, and on their return will deliver tools at point designated.

Rule 11. When it becomes necessary for employees to work overtime, they shall not be laid off during regular working hours to equalize the time. At points where sufficient number of employees are employed, employees shall not work two consecutive Sundays (holidays to be considered as Sundays). Record will be kept of overtime worked and men called with the purpose in view of distributing the overtime equally.

Rule 12. When necessary to fill temporary vacancies at outlying points, employees, excluding those specified in Rules 14 and 15, will be sent out and will be paid for this service as follows: Continuous time for time called up to time of reporting at point to which sent, overtime rates for all overtime hours, and straight time for the recognized straight time hours at home station, whether waiting or traveling (the same provisions to apply for return trip). While at such point they will be paid straight time and overtime in accordance with practice at home point with a guarantee of not less than eight hours' pay, at the established rate, for each calendar day, including Sundays and holidays at overtime rates. Where meals and lodging are not provided by the railroad, actual expenses will be allowed. Rules in existing agreements or shop rules covering the road service described in Rules 10 and 12, which are more favorable to the employees, are to be preserved.

Rule 13. Employees changed from one shift to another will be paid overtime rates for the first shift of each change. Employees working two shifts or more on a new shift shall be considered transferred.

Rule 14. Employees regularly assigned to road work whose tour of duty is regular, and who leave and return to home station daily (a boarding car to be considered a home station) shall be paid continuous time from the time of leaving the home station to the time they return, whether working, waiting or traveling, exclusive of the meal period, at straight time for the regular hours, and overtime rates for all overtime hours, as per overtime rules. The starting time to be not earlier than 6 a. m., nor later than 8 a. m. Where two or more shifts are worked, the starting time of each following shift will be regulated accordingly.

Rule 15. Employees regularly assigned to perform road work and paid on a monthly basis, shall be paid not less than the minimum hourly rate established for the corresponding class of employees coming under the provisions of this schedule, on the basis of 365 eight-hour days per calendar year, with pay at the rate of time and one-half time for Sundays and holidays designated herein; otherwise, overtime will not be paid. Where meals and lodging are not furnished by the railroad, or when the service requirements make the purchase of meals and lodging necessary, while away from home point, employees will be paid actual expenses. This service is distinct and separate from that performed by any other class of employees coming under the provisions of this schedule and is not to be confused therewith; the employees assigned to it shall not be assigned to or used to perform the construction, repair and emergency work assigned to the other employees under the provisions of the general and special rules of this schedule.

NOTE

The following is an example to be followed in arriving at the monthly rate:

365 days multiplied by 8 equals.....	2,920 hours
59 Sundays and holidays at one-half time will be	
59 x 4, equaling.....	236 hours

Total hours to be paid for..... 3,156 hours

The monthly salary is arrived at by dividing the total earnings of 3,156 hours by 12; no overtime is allowed for time worked in excess of eight hours per day; on the other hand, no time is to be deducted unless the employee lays off of his own accord.

Filling Vacancies.—Rule 16. When an employee is required to fill the place of another employee receiving a higher rate of pay, he shall receive the higher rate, but if required to fill, temporarily the place of another employee receiving a lower rate, his rate will not be changed.

Rule 17. Employees serving on night shifts, desiring day work, shall have preference when vacancies occur, according to their seniority.

Rule 18. When new jobs are created or vacancies occur in the respective crafts, the oldest employees in point of service shall, if sufficient ability is shown by trial, be given preference in filling such new jobs or any vacancies that may be desirable to them. All vacancies or new jobs created will be bulletined. Bulletins must be posted five days before vacancies are filled permanently. Employees desiring to avail themselves of this rule will make application to the official in charge and a copy of the application will be given to the local chairman.

Rule 19. Mechanics in service will be considered for promotion to posi-

tions as foremen. When vacancies occur in positions of gang foremen men from the respective crafts will have preference in promotion.

Rule 20. Employees transferred from one point to another, with a view of accepting a permanent transfer, will, after 30 days, lose their seniority at the point they left and their seniority at the point to which transferred will begin on date of transfer, seniority to govern. Employees will not be compelled to accept a permanent transfer to another point.

Rule 21. When the requirements of the service will permit, employees, on request, will be granted leave of absence for a limited time, with privilege of renewal. An employee absent on leave who engages in other employment, will lose his seniority unless special provisions shall have been made therefor by the proper official and committee representing his craft. The arbitrary refusal of a reasonable amount of leave of employees when they can be spared, or failure to handle promptly cases involving sickness or business matters of serious importance to the employee, is an improper practice and may be handled as unjust treatment under this agreement.

Absence from Work.—Rule 22. In case an employee is unavoidably kept from work he will not be discriminated against. An employee detained from work on account of sickness or for any other good cause shall notify his foreman as early as possible.

Faithful Service.—Rule 23. Employees who have given long and faithful service in the employ of the company and who have become unable to handle heavy work to advantage, will be given preference of such light work in their line as they are able to handle.

Attending Court.—Rule 24. When attending court as witnesses for the railroad, employees will receive pay for all time lost at home station, with a minimum of eight hours' time each week day and eight hours at rate and one-half for Sundays and holidays, either at home station, away from home, or traveling. Time and one-half will be paid for traveling during overtime hours where employees are unable to secure sleeping car accommodation. Actual expenses will be allowed when away from home station, and necessary expenses will be allowed when at home. When necessary, the company will furnish transportation and will be entitled to certificate for witness fees in all cases.

Paying Off.—Rule 25. Employees will be paid off during their regular working hours, semi-monthly, except where existing state laws provide a more desirable paying off condition. Should the regular pay day fall on a holiday or days when the shops are closed down, men will be paid on the preceding day. Where there is a shortage equal to one day's pay or more in the pay of an employee, a voucher will be issued to cover the shortage. Employees leaving the service of the company will be furnished with a time voucher covering all time due within 24 hours where D. C. checks are issued and within 48 hours at other points, or earlier when possible.

Rule 26. During inclement weather provision will be made where buildings are available to pay employees under shelter.

Reduction of Forces.—Rule 27. When it becomes necessary to reduce expenses, the force at any point or in any department or sub-division thereof shall be reduced, seniority as per Rule 31 to govern; the men affected to take the rate of the job to which they are assigned. Five days' notice will be given men affected before reduction is made, and lists will be furnished local committee. In the restoration of forces, senior laid off men will be given preference of re-employment, if available, within a reasonable time, and shall be returned to their former position; local committee will be furnished list of men to be restored to service; in reducing force the ratio of apprentices will be maintained.

Rule 28. Employees laid off on account of reduction in force, who desire to seek employment elsewhere, will, upon application, be furnished with a pass to any point desired on the same railroad.

Rule 29. When reducing forces, if men are needed at any other point they will be given preference to transfer to nearest point, with privilege of returning to home station when force is increased, such transfer to be made without expense to the company. Seniority to govern all cases.

Rule 30. Employees required to work when shops are closed down, due to breakdown in machinery, floods, fires, and the like, will receive straight time for regular hours, and overtime for overtime hours.

Seniority.—Rule 31. Seniority of employees in each craft covered by this agreement shall be confined to the point employed in each of the following departments: Maintenance of Way (Bridge and Building where separate from Maintenance of Way Department); Maintenance of Equipment; Maintenance of Telegraph; Maintenance of Signals; four sub-divisions of the Carmen as follows: Patternmakers, Upholsters, Painters, and other Carmen. The seniority lists will be open to inspection and copy furnished the committee.

Assignment of Work.—Rule 32. None but mechanics or apprentices regularly employed as such shall do mechanics' work as per special rules of each craft, except foreman at points where no mechanics are employed.

Rule 33. In compliance with the special rules included in this agreement, none but mechanics and their apprentices in their respective crafts shall operate oxy-acetylene, thermit, or electric welders; where oxy-acetylene or other welding processes are used, each craft shall perform the work which was generally recognized as work belonging to that craft prior to the introduction of such processes, except the use of the cutting torch when engaged in wrecking service.

Filling Foremanship Temporarily.—Rule 34. Should an employee be assigned temporarily to fill the place of a foreman, he will be paid his own rate, straight time for straight time hours and overtime for overtime hours, if greater than the foreman's rate. If it is not, he will get the foreman's rate. Such positions shall be filled only by mechanics of the respective craft in their departments.

Grievances.—Rule 35. Should any employee subject to this agreement believe he has been unjustly dealt with, or any of the provisions of this agreement have been violated, the case shall be taken to the foreman, general foreman, master mechanic, or shop superintendent, each in their respective order, by the duly authorized local committee or their representative. If stenographic report of investigation is taken, the committee shall be furnished a copy. If the result still be unsatisfactory, the duly authorized general committee, or their representatives, shall have the right of appeal, preferably in writing, to the higher officials designated to handle

such matters in their respective order, and conference will be granted within ten days of application. All conferences between local officials and local committees to be held during regular working hours without loss of time to committeemen.

Rule 36. Should the highest designated railroad official or his duly authorized representative and the duly authorized representative of the employees fail to agree, the case shall then be jointly submitted in writing to the chief executive officer of the railroad and the chief executive officer of the Railway Employees' Department of the American Federation of Labor for adjudication or final disposition. The methods of procedure will be those prescribed by the Railroad Administration. To the extent that these rules may remain in force after the expiration of federal operation, the methods of procedure will thereafter be such as may be agreed to by the representatives of the railroads and the representatives of the organizations herein specified. Prior to the assertion of grievances as herein provided, and while questions of grievances are pending, there will neither be a shut down by the employer nor a suspension of work by the employees.

Rule 37. An employee who has been in the service of the railroad 30 days shall not be dismissed for incompetency, neither shall an employee be discharged for any cause without first being given an investigation.

Rule 38. If it is found that an employee has been unjustly discharged or dealt with, such employee shall be reinstated with full pay for all time lost.

Committees.—Rule 39. The company will not discriminate against any committeemen, who from time to time, represent other employees, and will grant them leave of absence and free transportation when delegated to represent other employees.

Apprentices.—Rule 40. All apprentices must be able to speak, read, and write the English language and understand at least the first four rules of arithmetic. Applicants for regular apprenticeship shall be between 16 and 21 years of age, and if accepted, shall serve four years of 290 days each calendar year. If retained in the service at the expiration of their apprenticeship they shall be paid not less than the minimum rate established for journeymen mechanics of their respective crafts. In selecting helper apprentices, seniority will govern and all selections will be made in conjunction with the respective craft shop committees. (NOTE: See special rules of each craft for additional apprentice rules.)

Rule 41. All apprentices must be indentured and shall be furnished with a duplicate of indenture by the company, who will also furnish every opportunity possible for the apprentice to secure a complete knowledge of the trade.

No apprentice will be started at points where there are not adequate facilities for learning the trade.

Rule 40 shall govern in the employment of apprentices.

FORM OF INDENTURE

This will certify that.....was employed as aapprentice by the.....Railroad, at.....on.....19...., to serve four years, a minimum of two hundred and ninety days each.

(Title of officer in charge.)

SERVICE PERFORMED DURING APPRENTICESHIP

.....
.....
.....

This will certify that on....., 19...., completed the course of apprenticeship specified above and is entitled, if employed by the.....Railroad to the rates of pay and conditions of service of.....

(Title of officer in charge.)

NOTE: The above form is to be used both for regular and helper apprentices. (Helper apprentices to serve 3 years.)

Rule 42. The ratio of apprentices in their respective crafts, shall not be more than one to every five mechanics. Two apprentices will not be worked together as partners. The distribution of apprentices among shops where general repairs are made on the division shall be as nearly as possible in proportion to the mechanics in the respective trades employed therein. In computing the number of apprentices that may be employed in a trade on a division, the total number of mechanics of that trade employed on the division will be considered. If, within six months, an apprentice shows no aptitude to learn the trade, he will not be retained as an apprentice. An apprentice shall not be dismissed or leave the service of his own accord, except for just and sufficient cause, before completing his apprenticeship. Apprentices shall not be assigned to work on night shifts. An apprentice shall not be allowed to work overtime during the first three years of his apprenticeship. If an apprentice is retained in the service upon completing the apprenticeship, his seniority rights as a mechanic will date from the time of completion of apprenticeship. Preference will be given to sons of employees in the selection of apprentices to the extent of at least 80 per cent of the number employed.

Rates of Pay.—Rule 43. The rate for all mechanics who were receiving 68 cents per hour or more under Supplement 4 to General Order 27, except those provided for in Rule 45, will be increased 4 cents per hour, effective May 1, 1919. Steel car workers and other mechanics in the car department who were receiving the rate of 63 cents per hour, under Supplement 4 to General Order 27, will be increased 4 cents per hour, effective May 1, 1919. Other mechanics in the car department who were receiving 58 cents per hour, under Supplement 4 to General Order 27, will be increased 9 cents per hour, making a rate of 67 cents per hour, effective May 1, 1919.

Rule 44. Apprentices, helpers, and other classes of workmen covered by Supplement 4 to General Order 27, except those provided for in Rule 45, will be increased 4 cents per hour above the present rate, effective

May 1, 1919. This increase to apply also to men paid on the step-rates provided for in Section 2 and 2a of Article 2, Supplement 4 to General Order 27, except those provided for in Rule 45, effective May 1, 1919.

Rule 45. Linemen and others covered by Rule 141 shall receive 68 cents per hour, effective May 1, 1919. Groundmen covered by Rule 142 shall receive 62 cents per hour, effective May 1, 1919. Coal pier elevator operators and coal pier electric hoist operators as covered by Rule 143 shall receive 55 cents per hour, effective May 1, 1919.

Applicants for Employment.—Rule 46. Applicants for employment will be required to make statement only as to their ability, and address of relatives, except when their duties require them to distinguish signals or do flagging when they shall be required to pass the usual eyesight and hearing tests.

Conditions of Shops, Etc.—Rule 47. Good drinking water and ice will be furnished. Sanitary drinking fountains will be provided where necessary. Pits and floors, lockers, toilets and wash rooms will be kept in good repair and in a clean, dry and sanitary condition. Shops, locker rooms and wash rooms will be lighted and heated in the best manner possible consistent with the source of heat and light available at the point in question.

Personal Injuries.—Rule 48. Employees injured while at work will not be required to make accident reports before they are given medical attention, but will make them as soon as practicable thereafter. Proper medical attention will be given at the earliest possible moment, and employees shall be permitted to return to work without signing a release pending final settlement of the case. At the option of the employee, personal injury settlements may be handled under the provisions of Rules 35 and 36. Where death or permanent disability results from injury, the lawful heirs of the deceased may have the case handled as herein provided.

Rule 49. A place will be provided inside all shops and roundhouses where proper notices of interest to employees may be posted.

Shop Trains.—Rule 50. Existing conditions in regard to shop trains will be maintained unless changed by mutual agreement. The company will endeavor to keep shop trains on schedule time, properly heated and lighted, and in a safe, clean and sanitary condition. This not to apply to temporary service provided in case of emergency.

Free Transportation.—Rule 51. Employees covered by this agreement, and those dependent upon them for support, will be given the same consideration in granting free transportation as is granted other employees in service. General committees representing employees covered by this agreement to be granted same consideration as is granted general committees representing employees in other branches of the service.

Rule 52. Employees will not be required to work on engines or cars outside of shops during inclement weather, if shop room and pits are available. This does not apply to work in engine cabs or emergency work on engines or cars set out for or attached to trains. Should it become necessary to establish a regular night shift in shops, such men will not be used on running repair work unless work is brought to shop. When it is necessary to make repairs to engines, boilers, tanks and tank cars, such parts shall be cleaned before mechanics are required to work on same. This will also apply to cars undergoing general repairs. Employees will not be assigned to jobs where they will be exposed to sand blast and paint blowers while in operation. All acetylene or electric welding or cutting will be protected by a suitable screen when its use is required.

Rule 53. Emery wheels and grindstones will be installed at convenient places in the shop and will be kept true and in order.

Help to be Furnished.—Rule 54. Craftsmen and apprentices will be furnished sufficient competent help, when needed to handle the work, if available. When experienced helpers are available, they will be employed in preference to inexperienced men. Laborers when used as helpers will be paid the helpers' rate.

Rule 55. When dismantling or scrapping engines, boilers, tanks, cars (except wood cars) or other machinery, this work will be done by mechanics of their respective crafts. Sufficient help will be furnished. When wood cars are dismantled for scrapping, parts to be removed before car is burned or destroyed will be removed by carmen.

Rule 56. No employee will be required to work under a locomotive or car without being protected by proper signals. Where the nature of the work to be done requires it, locomotives or passenger cars will be placed over a pit, if available.

Rule 57. In shops and roundhouses not now equipped with connections for taking the steam from engines arrangements will be made to equip them so that steam from locomotives will not be blown off inside the house.

Rule 58. All engines will be placed under smoke jacks in roundhouses where practicable, when being fired up.

Rule 59. At shops and roundhouses equipped with electricity, electric light globes and extensions will be kept in tool rooms available for use.

Rule 60. When employees are required to check in and out on their own time, they will be paid one hour extra at the close of each week, regardless of the number of hours worked during the week.

MACHINISTS' SPECIAL RULES

Qualifications.—Rule 61. Any man who has served an apprenticeship or has had four years' experience at the machinists' trade and who, by his skill and experience, is qualified and capable of laying out and fitting together the metal parts of any machine or locomotive, with or without drawings, and competent to do either sizing, shaping, turning, boring, planing, grinding, finishing, or adjusting the metal parts of any machine or locomotive whatsoever shall constitute a machinist.

Classification of Work.—Rule 62. Machinists' work shall consist of laying out, fitting, adjusting, shaping, boring, slotting, milling, and grinding of materials used in building, assembling, maintaining, dismantling, and installing locomotives and engines (operated by steam or other power), pumps, cranes, hoists, elevators, pneumatic and hydraulic tools and machinery, scale building, shafting, and other shop machinery; ratchet and other skilled drilling and reaming; tool and die making, tool grinding and machine grinding, axle truing, axle, wheel and tire turning and boring; engine inspecting; air equipment, lubricator and injector work; removing, replacing, grinding, bolting, and breaking of all joints on superheaters; oxy-acetylene, thermit and electric welding on work generally recognized as

machinists' work; the operation of all machines used in such work, including drill presses and bolt threaders using a facing, boring or turning head or milling apparatus, and all other work generally recognized as machinists' work.

Machinist Apprentices.—Rule 63. Include regular and helper apprentices in connection with the work defined by Rule 62.

Machinist Helpers.—Rule 64. Employees assigned to help machinists and apprentices, operators of drill presses and bolt threaders not equipped with a facing, boring or turning head or milling apparatus, bolt pointing and centering machines, wheel presses, bolt threaders, nut tappers and facers; crane men helpers, tool room attendants, machinery oilers, box packers, grease cup fillers, and oilers, and applying all couplings between engine and tenders; locomotive tender and draft rigging work except when performed by carmen.

Assignment to Running Repairs.—Rule 65. Machinist assigned to running repairs, shall not be required to work on dead work, at points where dead work forces are maintained.

Dead Work.—Rule 66. Dead work means all work on an engine which can not be handled within 24 hours by the regularly assigned running repair forces maintained at point where the question arises.

Dead Work and Running Repair Forces.—Rule 67. Dead work forces will not be assigned to perform running repair work, except when the regularly assigned running repair forces are unable to get engines out in time to prevent delay to train movement.

Work at Wrecks.—Rule 68. In case of wrecks where engines are disabled, machinist and helper (more if necessary) shall accompany the wrecker. They will work under the direction of the wreck foreman.

Apprentices Classification of Work.—Rule 69. Apprentices shall be instructed in all branches of the machinists' trade. They will serve three years on machines and special jobs. Apprentices will not be required to work more than four months on any one machine or special job. During the last year of their apprenticeship they will work on the floor. Apprentices shall not work on oxy-acetylene, thermit, electric or other welding processes until they are in their last year.

Helper Apprentices.—Rule 70. Helpers who have had not less than two consecutive years' experience as machinist helper at the point where employed, at the time application for apprenticeship is made may become a helper apprentice. When assigned as a helper apprentice they must not be over 25 years of age.

Rule 71. Helper apprentices shall serve three years, a minimum of 290 days each calendar year, and shall be governed by the same laws and rules as governed regular apprentices.

Rule 72. The number of helper apprentices must not at any time exceed 50 per cent of the combined number of regular and helper apprentices assigned.

Rule 73. Helper apprentices shall receive the minimum helper rate for the first six months, with an increase of 2 cents per hour for every six months thereafter until they have served three years.

Helpers.—Rule 74. Helpers, when used in any way in connection with machinists' work shall in all cases work under the orders of the machinist, both under the direction of the foreman.

Rule 75. When vacancies occur under classification of machinist helper (temporary or permanent) machinist helpers in the service will be given preference in promotion to position paying either same or higher rate at station employed, seniority to govern.

Rule 76. Laborers, or similar class of workmen, shall not be permitted to do helpers' work as outlined in Rule 64 if regular machinist helpers are available.

Differentials for Machinists.—Rule 77. Machinists required to inspect locomotives and swear to reports required by the Federal Locomotive Inspection Law shall receive 5 cents per hour above the minimum rate paid machinists at the point employed. Autogenous welders shall receive 5 cents per hour above the minimum rate paid machinists at the point employed.

[Here follow special rules, similar to those for the machinists, for the boiler-makers, blacksmiths, sheet metal workers, electrical workers and carmen.—EDITOR.]

MISCELLANEOUS

Scope of General and Special Rules.—Rule 180. Except as provided for under the special rules of each craft, the general rules shall govern in all cases.

Effect on Existing Agreements.—Rule 181. In consideration of the standardization of hours of service and rules governing working conditions hereby established on all railroads in Federal operation, the general and special rules of this agreement shall supersede and be substituted for the general and special rules of existing agreements in conflict herewith; rules of existing agreements dealing with conditions of employment not specifically provided for herein shall remain in effect and be recognized as addenda to this agreement by the several railroads who negotiated such rules. Rulings that have been made by the Director General of Railroads and Railroad Board of Adjustment No. 2, where not in conflict with the rules of this agreement, shall remain in effect.

Duration of Agreement.—Rule 182. These general and special rules and regulations shall remain in full force and effect during federal operation unless superseded or amended as herein provided. They shall be printed by the railroads and each employee affected thereby shall be provided with a copy on request.

Revision of Agreement, Etc.—Rule 183. Should either the Railroad Administration or the organizations desire to revise these rules, a written statement containing the proposed changes shall be given and conference held within thirty days to arrange details necessary to negotiate to a conclusion.

Rule 184. Except as herein provided, nothing in these rules shall be construed to supersede methods of procedure promulgated by the Railroad Administration for the handling of grievances, or the application or interpretation of the provision of this agreement.

Rule 185. This agreement shall become effective 30 days after date signed by the Director General of Railroads, and the representatives of the employees' organizations.

Rule 186. Differentials provided for in this agreement for highly skilled employees shall become effective as of May 1, 1919.

Train Accidents in November¹

THE FOLLOWING is a list of the most notable train accidents that occurred on the railways of the United States in the month of November, 1919:

COLLISIONS						
Date	Road	Place	Kind of accident	Kind of train	Killed	Injured
11	Penn.	Crestline	rc	F. & F.	0	7
14	Louis'l. & N.	Edenwold	rc	P. & F.	0	4
24	Seaboard A. L.	Littleton	rc	P. & F.	0	2
*25	Penn.	McDonald	rc	F. & F.	2	2
26	A. T. & S. F.	Ft. Madison	bc	P. & F.	2	3

DERAILMENTS						
Date	Road	Place	Cause of derailment	Kind of train	Killed	Injured
13	Boston & M.	Berlin, N. H.	Washout	P.	1	0
17	Penn.	Lancaster	Neg.	F.	2	1
17	Penn.	Lancaster	Acc. obst.	P.	0	4
20	Gulf Coast	Settegast	Cattle	P.	0	4
*21	Georgia	Greensboro, Ga.	ms.	F.	0	1
24	Macon & B.	Skipperton, Ga.	Boiler	F.	1	1

OTHER ACCIDENTS						
Date	Road	Place	Cause of accident	Kind of train	Killed	Injured
6	Bessemer & L. E.	Hewitts, Pa.	Boiler	F.	3	0

The trains in collision on the Pennsylvania Lines at Crestline, Ohio, on the 11th, were an eastbound wrecking train, which had just stopped at the yardmaster's office, and a following locomotive without train, the locomotive crushing the rear car of the wrecker, injuring seven employees.

The trains in collision near Edenwold, Tenn., on the morning of the 14th, about 5 o'clock, were northbound passenger No. 4 and northbound freight No. 14, the passenger train running into the freight. Four trainmen were injured. The freight, entering the side track, was stopped before the caboose cleared the derail and this made it impossible to set the switch straight, and the passenger train entered the siding. It had passed an automatic block signal set at caution, but the signal nearest the switch indicated clear, the caboose of the freight having cleared the track circuit controlling that signal. It is said that a fusee had been placed about 700 ft., in the rear of the freight.

The trains in collision near Littleton, N. C., on the 24th were northbound passenger No. 16 and a preceding freight, the freight being run into by the passenger while standing at a station. The engineman and fireman were injured.

The trains in collision on the Pennsylvania Lines at McDonald, Pa., on the 25th were a westbound stock train standing at a water station; a locomotive without train following the stock train, and a third train, a freight, which ran into the light engine, pushed it forward, and wrecked the caboose of the standing train. A drover in this caboose was killed and his body partly destroyed by fire, and one fireman was fatally injured. Two other trainmen were badly hurt. The fire was started by coals from one of the fire boxes.

The trains in collision at the east end of the bridge across the Mississippi River near Fort Madison, Iowa, on the 26th, were westbound passenger No. 1, and an eastbound freight. The engineman and fireman of the passenger train were killed, and three other trainmen were injured. Both locomotives and two baggage cars were partly submerged in the river.

The train derailed on the Boston & Maine near Berlin, N. H., on the 13th, was a southbound local passenger, double-headed. Both locomotives and the two first cars were derailed at a washout and the locomotives were overturned. One fireman was killed and four other trainmen injured.

The trains involved in the accidents near Lancaster, Pa., on the 17th, were an eastbound freight, Extra 1137, and eastbound passenger No. 576. The freight train running past distant and home block signals set against it was thrown off

the track at a derailing switch, and the engine was upset. The passenger train, running on the middle track, was derailed by running into the freight wreck and its locomotive was overturned. The engineman and one brakeman of the freight were killed. Seven other employees and six passengers were injured; two cars in the passenger train being damaged. The accidents happened at 7:46 a. m., in a dense fog.

The train derailed on the Gulf Coast Lines at Settegast, Tex., on the evening of the 20th, was westbound passenger No. 3. Four cows on the track were struck by the locomotive and killed, and one of them, being thrown against a switch stand, knocked it over, opened the switch and derailed three of the cars of the train, two coaches being overturned. The train was crowded, but only ten persons were injured, and these injuries were classed as slight.

The train derailed near Greensboro, Ga., on the 21st, was an eastbound freight. The train ran off the track at a misplaced switch and ten cars were wrecked, together with the station building. Six freight cars and a part of the station were burned up. A traveling fireman was injured. The switch had been left wrong by a bridge foreman. The fire started from the stove in the station.

The train involved in the accident on the Macon & Birmingham, near Skipperton, Ga., on the 24th, was a westbound freight. The locomotive and tender were derailed by the explosion of the boiler, and the engineman was fatally scalded. The fireman was slightly injured. The cause of the explosion was low water.

The train involved in the accident at Hewitt, Pa., on the 6th, was a southbound freight. The boiler of the locomotive exploded and the engine was wrecked. The engineman, fireman and one brakeman were killed. The cause of the explosion was an overheated crown sheet, due to low water.

Canada—In a butting collision of passenger trains on the Canadian Pacific near Terrebonne, Que., on the evening of the 22d, one engineman and one express messenger were killed and six passengers were injured.



From the Baltimore Sun

His Letter to Santa Claus

¹Abbreviations and marks used in Accident List:
rc, Rear collision—bc, Butting collision—xc, Other collisions—bb, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open rerailing switch—ms, Misplaced switch—ass, obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P. or Pass., Passenger train—F. or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

The Proposed Trans-Saharan Railway

Technical Consideration Involved in the Construction of a Railway Across the Desert of Sahara

FOR MANY YEARS France has recognized the desirability and value of a rail connection across the Sahara desert between Southern Algeria on the North and Western French Africa on the south. The "Genie Civil" has in the past discussed several proposed routes and has but recently reviewed the situation, describing some of the technical problems that must be met in the construction of this railway, from which the following is taken:

Before the war the two principal Sahara rail routes mentioned were those of the engineer in chief for bridges and roads, Souleyre, who suggested a line from Biskra to Tom-

to Cairo" railway, with the vast and prosperous regions of South Africa.

Quite recently other projects have been introduced, hardly less striking, such as the Paris-Madrid-Tangiers-Dakar line and the Trans-Soudanese line starting from Dakar (and from Conakry) going to Fort Lamy and Khartoum, with a terminus at Port Soudan and Djibouti on the Red Sea, which was recommended by M. Tilho. On account of the economic conditions brought about by the war, however, there is, of course, no possibility of the immediate realization of any of these plans. Nevertheless there is no reason now for not making some surveys in order to facilitate the work for the next generation.

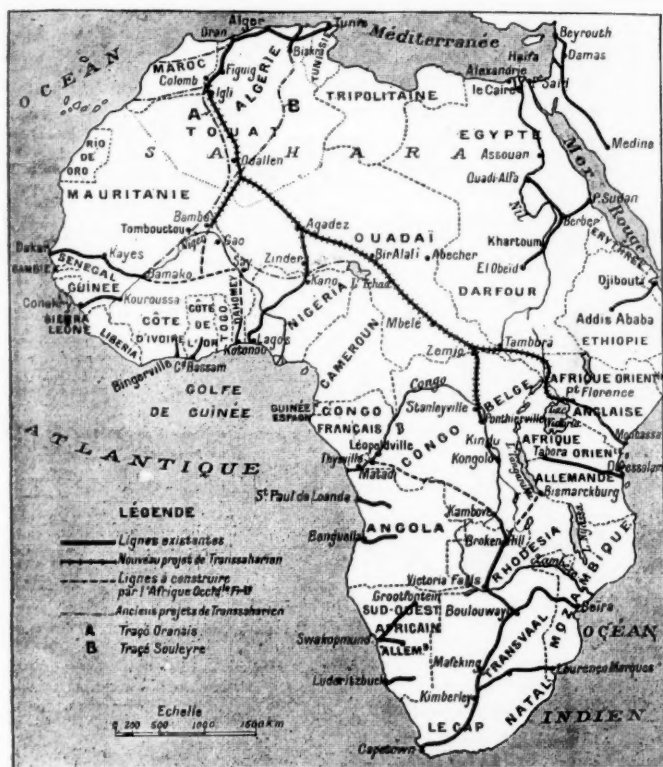
Two memorandums on this subject were published quite recently, one by Lieut.-Colonel Godfrey, director of the Biskra-Houggourt Railway and another by M. L. Durand, director of technical service works of Southern Algerian territory. M. Godefroy in his discussion of the Trans-Saharan railway takes into consideration that the "Trans-Africans" aspire to a continental trade and even to a trans-continental one. With a line across the Sahara, London and Paris could be put in easy communication by a combined service of steamers and rapid trains with Central Africa on the one hand (via Marseilles, Algeria, the Belgian Congo and the Great Lakes), and with South America on the other hand (via Marseilles, Algeria, the buckle of the Niger, Dakar and the crossing from Dakar to Pernambuco (See Fig. 1).

M. Godefroy considers that if it is wished to establish a junction between Algeria and the "Cape to Cairo" railway, it would be advantageous instead of joining up with this line in the center of Africa, to join it at Cairo itself by a line running from Fez-Algiers-Tunis-Tripoli and the Tripoli line and Cyrenean Coast. This railway would have, besides general traffic, the advantage of serving the immense number of Mussulman pilgrims to Mecca, pilgrims who every year fill up entire ships, and for whom the railway from Damascus to Medina was constructed by the Turkish government in 1908. The Fez-Cairo railway exists already in part up to Gabes on one side and from Daba to Cairo via Alexandria on the other. On the other side the strategic railway constructed by the British to revictual its Palestine Expeditionary Force could be easily extended as far as the Mecca railway.

The Trans-Saharan line which is recommended by M. Godefroy starts from Touggourt, the present terminus of the Algerian system (Algiers and Constantinople-Biskra-Touggourt railway) and descends via Ouargla (the date region), In-Salah, crosses the Tidikelt and the Adrar in order to arrive near Bourem. This involves about 1,470 miles of line. (See Fig. 2.) The point at which this line crosses the Niger, at Tosaye, the river flows between two steep banks where a bridge could easily be erected. With the line from Touggourt to Algiers the journey from Algiers to the Niger would be about 1,860 miles. At the present time the line has been surveyed as far as In-Salah.

Trans-Saharan Traffic

With this line in operation western French Africa would be able to send numbers of workers into Algeria and Tunisia for agriculture and the mines which are in want of manual labor; thence there would be a very nearly constant stream



As indicated in the legend, the full lines indicate existing railroads; the cross hatched lines the new Trans-Saharan project; heavy dotted line, other lines proposed for construction by the French and the dot and dash line, older Trans-Saharan projects.

Fig. 1—Map of Africa, Showing New Lines Proposed Before the War

bouctou via Touggout and In-Salah, with a branch line to Lake Tchad (Fig 1-Line B), and the project of M. Andre Berthelot, which takes as the point of departure Colomb-Bechar, the terminus of the line Sud-Oranais (Fig.1-Line A). Other promoters suggested a program even more extended, suggesting communications between Algiers, the Niger, the Belgian Congo and British East Africa by branch lines going respectively to Tombouctou, the terminus (Kano) of the Nigerian railway, then Stanleyville on the River Congo and finally to Port Florence on Lake Victoria (terminus of the British railway running from Mombasa, a port on the Indian Ocean). It was a question first of connecting Algeria (and as a result Morocco and Tunis) with West and equatorial Africa, of which the wealth (notably the mineral reaches of Katanga, in the Belgian Congo) gives great hopes, and then, by a junction with the future "Cape

of natives between the North and the South. Higher class passengers would obviously be few, but this railway would easily supplant the sea route for mail and freight which is very much slower than the service that could be provided by this new line. The freight frame would consist chiefly of rice from the Soudan and cattle on foot or frozen meat from the buckle of the Niger going North; conversely wheat, fruit, dates from Algeria, textile fabrics and manufactured products and stock of mechanical tools going South.

Technical Problems Involved in the Construction

The experience acquired in the working of the Southern Algerian Oranais railways will be of great assistance in the construction of the Saharian railroad. A summary of M.

have to be made if the normal gage is to be used. It would seem, therefore, more practical for the use of a gage to accommodate the connecting lines and thus obviate the necessity of a transshipment. Furthermore a narrow gage would not necessarily mean a restriction of traffic and with track of easy curves and grades sufficient speed can be obtained provided the track is sufficiently strong. Furthermore if in a certain number of years the traffic justifies a change from a narrow gage to the normal gage it could easily be done without interrupting the service, by widening the road bed and by placing ties for the normal gage between the existing ties and supplying the new rails to them. M. Durandau proposes to use the double head rails of 65-ft. in length, weighing 85-lb. per yard, placed on chairs weighing about

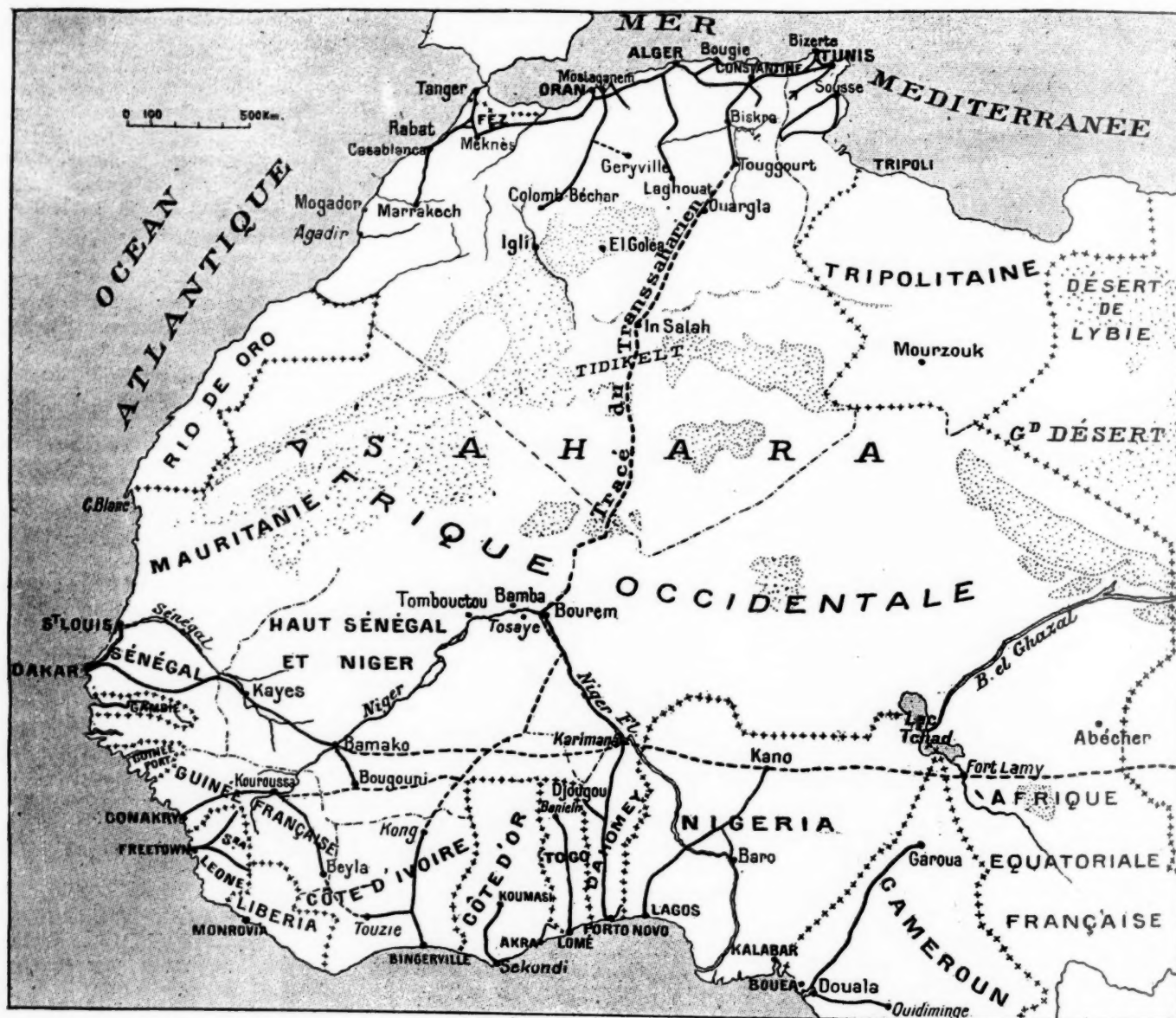


Fig. 2—Map of West Africa, Showing the Proposed Trans-Saharan and Trans-Soudanian Lines

Durandau's discussion of the problems to be encountered is given below. The construction and maintenance of such a line differs above all in its details of construction and maintenance from a European railway on flat ground.

The plans for this railway as recommended by Souleyre and Berthelot included the use of a normal gage, but this exists only on one part of the Algerian railway system. The line of the Southern Oranais is of 1.05 meter gage while the Southern Algerian line is 1 meter gage. Thus, if the line is extended over either of these roads a transshipment will

31-lb. These chairs to be mounted on cedar ties measuring 7-ft. 2½-in. by 10½-in. by 6-in. or upon metallic ties weighing 99lb. which are to be 6-ft. 11-in. long. It is anticipated that this track will be able to support an axle load of 36,500-lb. and speeds of 37 miles an hour.

The use of double headed rails mounted in chairs is believed necessary in order to raise the track as high as possible above the ballasting so as to facilitate the passage of the fine gravel driven by the wind between the ties and to lessen the risk of sand banks on the rails. Furthermore, due

to the saline nature of the ground in a large part of the territory to be covered, it is necessary to keep the rails as high above the ground and as dry as possible, to prevent serious corrosion. The chlorides and sulphates under the influence of the variations of humidity give off acids which will attack the metal very rapidly. In such districts it is obviously necessary to use the wood ties instead of the metallic ties.

In order to avoid the drifting of the sand on to the switches, which has often caused accidents on the Southern Algerian railways, it will be necessary to place the switches on chairs and, furthermore, place the ties on a floor composed of other ties parallel to the track and joined. This will enable the sand to slip away between the switches and the ties.

The question of width of the road bed and of ballasting is of first importance for a Saharian railway, for the maintenance staff will be inevitably small. It will of necessity be made of sand for a large part of the way and it will be difficult to maintain it properly on account of the wind and it will be necessary to clear the track of the drifted sand frequently.

Ballasting with good quality broken stone would cost a great deal on account of the long haul. Ballasting made of gypsum of which there is a large quantity readily available would become quickly disintegrated and would be a detriment not only to the track but to the health of the staff.

When laying out the line it will be necessary to keep away from sand-hills as much as possible and to build wind-breaks on those which are near the track. Plantations of tamaris can be used to very good advantage for this purpose. The location of the line should be carried out much less with the idea of obtaining a straight line than to avoiding slopes and inclines; provided that large gradients are maintained for curves, the visibility of the track and the maximum speed obtainable are almost the same as on a straight line.

The great inconvenience pointed out, relative to the possible corrosion of the rails, is met with again in connection with mortar, lime or cement, to which the saline nature of the soil is absolutely injurious. The experience with masonry of the railways of the Southern Constantinois has shown that the variations of heat and cold, of dryness and humidity, influence in an unfavorable way the resistance of cements which are at the same time affected by chemical decompositions.

M. Durandeu advises using freestone, without mortar, and cedar wood, or drystone masonry, and the use of thick lime when mortar is indispensable.

In the Sahara where materials for construction are wanting, only rough stone of gypsum is found which for all works of masonry such as buildings, small aqueducts, etc., can be perfectly well used with mortar of thick lime and sand found on the spot. It will be very desirable to construct the drystone masonry in metallic gabions. The use of these gabions permits raising the piles and gives greater security.

Organization for Construction

It is obvious that the line across the Sahara Desert will have to originate from Southern Algeria. All material can be supplied to the construction workshops from the lines already laid in that country. The advance working party which would lay the ballasting would require in the neighborhood of 2,000 "navvies" and it is anticipated that 2 kilometers of rail could be laid per day. The workmen and the foremen could be lodged in a train of some 50 freight cars (the small freight cars or wagons are used in this country) and the working train would consist of one tractor equipped for generating electricity, one office wagon, one store wagon, including a kitchen and restaurant, two wagons for the housing of the foremen, one ambulance wagon, wagons for the

European workmen, and finally a large number of wagons for the natives.

Every morning and evening a train with working stock and stores would bring along a kilometer of track for laying in the evening or on the following morning. This material would be unloaded behind the train for the use of the staff and would be picked up by some special arranged loading device under the trucks of the working train and carried forward to the point of working. As the line progressed, stations would be instituted at intervals of 100 kilometers for stocking working train at the front.

Traction Units for Use on the Desert

On account of the scarcity of water and particularly on account of the extremely bad water found on the Desert it is impracticable to use steam locomotives for hauling the trains. Furthermore, coal for use on locomotives would have to be brought to the railway from Europe at great expense. It therefore seems preferable to plan on the use of Diesel or Still type of internal combustion engines or electric traction. It is a question which is still to be studied, but it is believed no difficulty will be experienced in this respect by the time the Trans-Saharan railway is built, due to the rapid progress in this particular subject.

Such are the problems involved in the construction of a conditions, particularly in Europe, it evidently will be some Trans-Saharan railway, and due to the present economic time before the work can be undertaken.

Freight Locomotive and Freight Train Costs

THE TOTAL COST of freight train service, including locomotive service, per 1,000 gross ton miles, which had been decreasing each month this year, including August, has been increasing in the fall months and was slightly greater in September than in August and in October, as compared with September, according to the monthly report of the Operating Statistics Section, although the report shows a decrease as compared with October, 1918. For October, 1919, it was 105.8 cents, as compared with 108.2 cents in October, 1918, and 101.1 cents in September, 1919. In August, 1919, it was 99.5 cents. Per locomotive mile and per train mile the cost was greater than for October of last year. The cost of freight locomotive service per locomotive mile in October was 109.8 cents, as compared with 108.7. In September it was 106.7 cents. The cost of freight train service per train mile in October was 159.8, as compared with 157.8.* In September it was 156.2. The combined figures for all regions and the comparative figures for last year are as follows, (costs for 1918 have been readjusted for back pay, while the costs for 1919 apply to the month of October only, the back pay applicable to previous months having been eliminated):

	October	
	1919	1918
Cost of locomotive service per locomotive mile (cents)...	109.8	108.7
Locomotive repairs	35.5	35.1
Enginehouse expenses	8.0	8.4
Train enginemn	21.1	19.3
Locomotive fuel	41.7	42.5
Other locomotive supplies.....	3.5	3.4
Cost of train service per train mile.....	159.8	157.8
Locomotive repairs	49.4	50.1
Enginehouse expenses	47.3	48.9
Locomotive fuel	4.0	4.9
Other locomotive supplies.....	24.0	22.2
Train enginemn	27.6	25.8
Trainmen	7.5	6.8
Train supplies and expenses.....	105.8	108.2
Locomotive repairs	32.7	34.4
Enginehouse expenses	31.3	33.5
Locomotive fuel	2.6	2.7
Other locomotive supplies.....	34.1	33.0
Enginemn and Trainmen.....	5.0	4.7
Train supplies and expenses.....		

Railroad Surplus or Deficit Depends on Method of Figuring

THE INTERESTING QUESTION as to "when is a surplus not a surplus?" which has been agitating Congress, the labor leaders and others who have been discussing the railroad problem ever since the Railroad Administration gave to the press the surprising news that it had earned a surplus in July and followed it with similar statements for August, September and October, has now been answered by a statement authorized by Director General Hines explaining the matter. The statement for some reason received little publicity, but he shows that while in those four months the net operating income of the roads was \$22,516,446 greater than four-twelfths of the standard return, it was also \$29,573,000 less than the roads earned in the corresponding four months of the test period on which the standard return is based.

Senator LaFollette and other advocates of government ownership or continued government operation of the railroads have been using the surpluses derived by comparison with one-twelfth of the standard return for each month as arguments to prove that the railroads are now on a self-sustaining basis and if retained by the government could be operated without a rate increase, ignoring the fact that the Railroad Administration has not yet succeeded in standardizing the months of the year and that the roads ought to earn much more than that in the fall months in order to make a favorable showing. Also the representatives of organized labor and of some of the farmers that recently called at the White House to urge the President to keep the railroads went so far as to say that the railways showed a net profit "at the rate of \$168,000,000 a year" for the three months prior to the coal strike.

This reminds one of Abe Kabibble's boast that he made "\$5,000 a year some weeks." In those three months the roads actually earned \$68,000,000 less than they did in the corresponding months of 1918, in which year the deficit was \$236,000,000, whereas this year it is \$269,000,000 for only 10 months. The \$168,000,000 was arrived at by multiplying by four the \$42,000,000 surplus for August, September and October arrived at in a statement issued by the Railroad Administration by comparison with three-twelfths of the standard return after charging out the back pay applicable to prior months and also by reaching into November for about \$9,000,000 for business done in October, which would not be taken into the accounts until November.

In its press notices regarding monthly operating results, the Railroad Administration has consistently made its comparisons with one-twelfth of the standard return—\$74,356,354—because it is payable in equal quarterly instalments, although this method had the effect of overstating its deficit in the early months of the year and of understating it in the later months. In a condensed income account compiled monthly for the Class I roads by the Operating Statistics Section, however, the "net federal income" is compared with the standard return for the period covered by the report, based on the proportion which the railway operating income in the same period of the three years of the test period bore to the total railway operating income during the test period. The proportions to be used for each month, as given in a footnote to its reports, are:

	Per cent		Per cent
January	6.228	July	8.363
February	5.257	August	9.643
March	7.517	September	10.113
April	7.438	October	10.436
May	8.568	November	9.222
June	9.149	December	8.066

The total net operating income for the 10 months of this year for which reports are available was \$478,982,635, as compared with \$599,976,783 in the corresponding period of

1918. Ten-twelfths of the annual rental is \$743,563,540, and on that basis the 10 months' deficit is \$264,580,905, but the proportion of it that accrued in the corresponding 10 months of the test period was \$748,252,000, and on that basis the deficit is \$269,000,000, a difference of less than \$5,000,000. But for October alone the two methods produce very different results.

The net operating income was \$76,959,777, which represents a surplus of \$2,603,423 as compared with one-twelfth of the standard return, but a deficit of \$17,417,000 as compared with the \$94,387,000 which the roads earned in the average October of the test period. In October, 1918, the net operating income was \$86,184,486, so that there was actually a greater deficit in October this year than last year. Mr. Hines' statement, which also takes into account some adjustments for back pay, is as follows:

"For each of the four months, July, August, September and October, the Class I railroads in federal operation have shown an aggregate profit after deducting one-twelfth of the rental. The total of the profits for the four months thus shown were \$22,516,446. The question has been raised as to whether there ought not to have been deducted a larger proportion of the rental corresponding with the proportion of net operating income which the railroads under private management earned on an average in the corresponding months of the three-year test period. The Railroad Administration has adopted the same policy in the four months in question that it adopted in the preceding six months. Uniform deduction of one-twelfth of the rental was made each month, because the standard contract provides that three-twelfths of the annual rental shall be paid at the end of each three months, so that in effect the Railroad Administration must account for one-twelfth of the annual rental each month, and hence it seemed appropriate to charge it accordingly.

"But since the method thus used for the months of July to October has been questioned, it seems desirable to call attention to what the result would be for this four months' period if there were deducted a proportion of the annual rental in excess of four-twelfths and equal to the proportion of the annual operating income earned by the railroads in the corresponding four months of the test period. In arriving at this result there has also been deducted the back payments made the shopmen for the four months in question. A deduction has also been made of the estimated cost of recent readjustments of wages and working conditions, such as allowance of time and a half for overtime to certain additional classes of employees, including train and enginemen in road freight service. While none of these readjustments were actually applicable to the months in question, the deduction of the estimated amounts thereof serves to make the result for the four months more indicative of the result for the future, and hence a more useful index to the real earning capacity of the railroads in federal operation, on the basis of existing wages and working conditions. The hire of equipment is also treated on a uniform basis, though a different method of accounting therefor was adopted in October.

"On the basis thus indicated the loss for the four-month period, after deducting the larger proportion of the rental as above explained, would have been approximately \$29,573,000. This amount is two and two-tenths per cent of the operating revenues from freight traffic for the period. This gives full effect to the relatively heavy business normally done in these four months, as indicated by the operating income of the same four months during the test period.

"As bearing on the significance of this result as an index to real earning capacity of railroads in federal operation, it is desirable to emphasize that on the average the maintenance expenditures for the four-month period were adequate to maintain the property and were fairly related to the ex-

penses for the test period after taking into consideration the increases in prices and wages.

"It must be remembered that to the extent to which this larger deduction for rental is made in the four-month period in question, there must be a corresponding diminution in the rental, and hence in the deficit heretofore shown in the first six months of the year.

"Attention has heretofore been called in the monthly statements issued by the Railroad Administration to the fact that there was an abnormal falling off in freight business in the

early part of the year and that this was prolonged over an abnormal period of time, covering the entire first six months, and that to a substantial extent the relatively large deficit incurred in the first six months was due to this great and prolonged diminution of freight traffic. The traffic for the months of July, August, September and October has been on a more normal basis, although in the latter part of October it was seriously deranged and carried on under especially unfavorable conditions by reason of the impending coal strike."

Cummins Railroad Bill Passed by Senate

Sent to Conference with Esch Bill—President Fixes
March 1 for Return of Railroads

THE SENATE on December 20 passed by a vote of 46 to 30 the Cummins bill for the reorganization of the railroad system of the United States and of the system of railroad regulation, without having heard from the President on his intentions as to the return of the roads. The bill, together with the Esch bill passed by the House on November 20, was then sent to conference for the reconciliation of the many important differences between them; and the conferees have begun work during the holiday recess of Congress, which lasts until January 5, in the hope that they can submit a report some time in January. The conferees are Senators Cummins, Kellogg, Poindexter, Pomerene and Robinson and Representatives Esch, Barkley, Hamilton, Sims and Winslow, who constituted the sub-committees of the Senate and House committees on interstate commerce, respectively, that did most of the work on the bills, having drafted the tentative bills which constituted the basis for the bills later reported by the full committees.

Only Eleven Votes for Government Operation

The Senate passed the bill apparently without any great degree of enthusiasm, after three weeks of debate, during which there was a very slim attendance, including five night sessions. It seemed far more interested in getting the bill out of the way in time for the holiday recess and as to its provision a large number of senators relied on the judgment of the committee on interstate commerce, that had worked on the bill throughout the greater part of the year, or upon the conferees, upon whom rests the responsibility of drafting the final bill. Many who did not fully understand or were in doubt as to the wisdom of many features of the bill voted for it because it provides for the return of the railroads to private management or because the conferees may save them trouble of making up their minds as to many of its provisions or will give them another chance to vote.

The most pronounced expression of sentiment in connection with the bill came on Senator LaFollette's motion to substitute for it a two-year extension of the present federal control, which received only 11 votes, while there were 65 against it. On the motion to substitute the Senate bill for the House bill there were 41 votes to 17, but this probably was influenced more by the desire to get the two bills into conference than by the exact division of opinion as to the two bills.

Efforts to eliminate or change the fundamental principles of the bill met with little support, and were represented rather by the votes against the bill than by proposals for modifications in it. The most important change made in the Senate was the addition of a provision for a revolving fund of \$500,000,000 for loans to railroad companies for capital improvements.

The Senate apparently had difficulty in drawing a clear-cut issue on the bill, although the party line was in evidence as 33 of the votes for it were Republican and 13 Democratic, while 22 of the votes against it were Democratic and 8 Republican. Three Republicans, Gronna, LaFollette and Norris, and eight Democrats, Ashurst, Chamberlain, Henderson, Johnson of South Dakota, Kendrick, Nugent, Sheppard and Walsh of Montana voted for the continuation of government operation.

The organized propaganda against the bill carried on by the labor organizations and one of the several organizations that claim to represent the farmers, was based on the assertion that the bill had been dictated by and was wholly for the selfish interests of the railroads, but this was so manifestly untrue and railroad support for the bill was so conspicuously absent that it hardly represented a satisfactory issue and probably as many votes were cast against the bill on the ground that it was not sufficiently generous to the railroads as because of a belief that it gave them too much.

The railroad executives themselves indicated far more opposition to the bill than support of it, although their efforts were directed more particularly for or against individual provisions of the bill and in general they apparently took the position of being grateful for whatever they could get. Senator Chamberlain of Oregon at one time asserted that the railroad executives were repeating the performance of the brotherhoods at the time they were said to have forced the passage of the Adamson law "at the point of a gun" and he declared that the railroad presidents and general managers were in the galleries demanding the passage of the bill. The only railroad executive in the galleries at the time was S. Davies Warfield, who is chairman of the Seaboard Air Line, but who is also president of the National Association of Owners of Railroad Securities. Senator Cummins replied to Senator Chamberlain, saying that the railroad executives were opposed to the bill and that if any one knew of a railroad president in favor of it he would be glad to have him named.

Mr. Warfield was an interested observer of the proceedings throughout and Bird M. Robinson, president of the American Short Line Railroad Association, was also in the gallery part of the time but railroad officers were most conspicuous by their absence.

A considerable number of amendments to the bill were adopted but most of them applied to details. Some of the provisions which it had been predicted would meet with bitter opposition, such as those for federal incorporation and compulsory consolidation, aroused comparatively little discussion. The labor provisions were the cause of the liveliest controversy but the prohibition against strikes

was left intact. It was apparent that the labor organizations had much less influence in the Senate than they had in the House because, whereas the House had adopted by a large majority the Anderson amendment which incorporated the views of the labor organizations, including the confirmation of all wage orders of the Railroad Administration for the future, the Senate voted down by a large majority the amendment in which the labor organizations were particularly interested—that to strike out the labor provisions entirely—and only 11 votes were cast for their proposal for a two-year extension of government operation.

The character of the bill that will ultimately be adopted now depends very largely upon the work of the conferees, because the bills are so fundamentally different that a great deal depends upon which of the conflicting provisions are sacrificed for trading purposes in the efforts to reach an agreement. It is also regarded as certain that it will be necessary for the two groups of conferees to seek instructions from their respective houses. Moreover, a great deal depends upon the character of the changes that are agreed upon in the provisions of the two bills that are somewhat similar in purpose and intent but vary in important details. A very large part of the Esch bill is also in the Cummins bill, but the latter included many important features not in the Esch bill.

Differences Between House and Senate

These include the rule of rate-making, based on an instruction to the Interstate Commerce Commission to make rates produce a net operating income as nearly as may be to $5\frac{1}{2}$ per cent on the aggregate value of the property in each rate-making district, with a division of earnings above 6 per cent; the proposed consolidation of the railroads into 20 to 35 systems, the creation of a transportation board to take over many of the present functions of the Interstate Commerce Commission, as well as the new functions provided for in the bill; the anti-strike provisions and the provision for federal incorporation. While the House bill provides for bi-partisan wage boards without any provision for a decision in the case of their failure to agree, the Senate bill provides for an appeal to the transportation board.

Both bills provide for the return of the railroads to private management, but greatly increase the extent of their regulation by federal authority. While the Senate bill would return the roads on the last day of the month in which the act is approved, the House bill provides that if this shall take place after the fifteenth day of the month the transfer shall be at the end of the following month.

Both bills provide for the funding of indebtedness of the carriers to the government, but under different conditions, and while the House bill provides for a period of 10 years, not beginning until after the first five years from the date of the act, the Senate bill makes the 10-year period begin at once. The House bill also reduces the amount of the capital expenditures that may be funded by deducting a large part of the indebtedness of the government to the railroads on account of compensation.

Both bills provide for a temporary guaranty to the railroads pending a decision of the Interstate Commerce Commission as to a proper level of rates. The Senate bill allows the roads two months within which to file tariffs and provides for the guaranty and the commission shall render its decision, or for four months after the filing of tariffs, while the House makes the guaranty period a straight six months, but the Senate bill would allow a guaranty based on a proportionate amount of the guaranteed standard return, which would be one-twelfth of the annual rental for each month of the guaranty period, while the House bill provides for a guaranty not less than the average operating income for the three corresponding periods of six months in the test period,

which would be considerably less than one-half of the year's rental if the guaranty period begins in the first part of the year. The Senate bill provides that any railroad earning more than its guaranty during the period shall pay the excess into the treasury of the United States, but the House bill contains no such provision.

The House bill provides for a loan fund of \$250,000,000, while the Senate bill provides for \$500,000,000.

A summary of the principal provisions of the Cummins bill was published in the *Railway Age* of October 3 (issued November 19).

No Message from President

It had been fully expected that the President would send to Congress his promised message on the readjustment of the affairs of the railroads growing out of federal control before the members left the city for the holiday recess, but Congress was allowed to recess without having heard from him as to whether or not he had changed his mind about relinquishing the railroads at the end of the year. This made it impossible for him to address Congress before January 5, which led to a belief in the minds of many that he had decided to let the legislation take its course and let the date for the return of the roads be fixed by Congress. The fact that both bills provide in a generally similar way for the return of the roads would make it possible for him to take the position that Congress had taken the matter out of his hands after he had announced his intentions last May.

The plan which had been proposed in November to enact temporary legislation providing for an extension of the guaranty pending the completion of permanent legislation was abandoned in view of the fact that the passage of the bill by the Senate made it possible to hope for the final passage of the bill some time in January.

Debate on the Senate Bill

The debate in the Senate up to December 16 was reported in last week's issue.

On December 16 Senator Poindexter of Washington delivered a lengthy address in favor of his amendment to strike out the proviso in the long and short haul clause, which gives the Interstate Commerce Commission discretion in permitting exemptions from the strict application of the law in order to leave the so-called long and short haul rule as contained in the act to regulate commerce unqualified.

The Senate committee on interstate commerce at one time had reported favorably the Senator's bill to provide for a rigid long and short haul clause, but in the Cummins bill it adopted a compromise attaching to the commission's discretion the requirement that the lesser charge for the longer distance must be fairly compensatory and that no relief shall be allowed on account of merely potential water competition.

Senator King of Utah stated that many of the senators are very earnestly in favor of Senator Poindexter's amendment and would not allow the bill to go through if they could have their way unless the proviso were stricken out. After some discussion the amendment was allowed to go over until the following day, when it was defeated by a vote of 25 to 41.

An amendment was offered by Senator Gay of Louisiana to exempt from the provisions relating to the grouping, consolidation or federal incorporation of carriers and the adjustment of rates to yield the return prescribed in the bill and the disposition of excess operating income of belt line, terminal or switching railroads or other terminal facilities owned and operated by any state or political subdivision thereof. The purpose was to exempt the belt line owned by the city of New Orleans. Senator Cummins explained that

the bill does not apply to belt lines and switching facilities, but the amendment was adopted.

Revolving Fund Increased

Senator Frelinghuysen of New Jersey offered an amendment providing for a revolving fund of \$750,000,000, from which loans could be made to railroads by the transportation board under provisions similar to those included in the Esch bill, which provides a fund of only \$250,000,000. The Senator explained that the necessity for such a loan fund had become apparent in the last few days, because a committee of bankers, advising in respect to the proposed general equipment trust to take care of cars and locomotives purchased by the director general, has advised that market conditions are not favorable now to the placing of even that gilt-edged security, and therefore apprehension had been expressed that less attractive securities offered by the railroads during the coming year may not be any more successful.

The vital public interest in adequacy of facilities and service in the immediate future seems to require, he said, that in the absence of a public market for railroad securities Congress should provide a credit with which the railroads can proceed with essential work. If the Senate bill contains no such provision, under the conference rules the conferees would be limited to the acceptance or rejection of the provision in the House bill providing for a fund of \$250,000,000, and he desired to include provision for a possible \$750,000,000 in order that the conferees may exercise their discretion between the two sums.

Senator Frelinghuysen read a letter from Director General Hines, whom he had asked for an estimate, in which Mr. Hines expressed the opinion that the railroads would hardly be able to expend more than \$400,000,000 on capital account during 1920, but that at least 50 per cent additional ought to be expended. The Senator said that maturities in 1920 would amount to \$221,000,000, one-fifteenth of the sums to be paid on the rolling stock already purchased by the Railroad Administration would require about \$25,000,000, and that improvements other than equipment already contracted for are estimated by the director of capital expenditures of the Railroad Administration at from \$200,000,000 to \$250,000,000 of new money, making a total of \$446,000,000. It seems obvious, he said, that an insurance of \$750,000,000 of loans would be moderate in case investment conditions should continue for any length of time as they now are, or at least it would be pertinent for the Senate to permit the conferees the latitude suggested. Mr. Hines' letter was as follows:

"Your inquiry presupposes that the capital expenditures would be planned and carried out by the railroad companies. On that assumption it must be borne in mind that the companies will require time to formulate and adopt plans and arrange for financing. This will all require considerable time, and it is not probable that the companies would be able to enter in a confident and effective way upon the making of provision for either betterments to roadway or acquisition of additional rolling stock upon an extensive scale prior to March 1, next. The amount that they would be able to spend in the calendar year 1920 would be considerably curtailed by such a late start in putting their plans into effect. Taking this into consideration, my judgment is that \$400,000,000 would represent approximately the expenditure of cash which they would actually be able to make in the remaining part of the calendar year 1920. There is a possibility that this might be somewhat exceeded, but I do not think, in any event, it would go beyond \$500,000,000, and I think the probability is much more in favor of \$400,000,000.

"I do not mean by the foregoing that the figure of \$400,000,000 represents the full amount that ought in the public interest to be expended during the year 1920. On the contrary, I should say that at least 50 per cent additional ought to be expended in order reasonably to provide for the needs of the public service;

but, in my opinion, this larger and more desirable provision cannot be made because of the delay which will inevitably be connected with the transition back to private control and with each company thereafter making its own independent plans and necessarily waiting until it can obtain some more definite light as to its financial status."

Senator Frelinghuysen said it would be good business for the United States government at this time, when the credit of the transportation systems of the country is at its lowest ebb and when underlying securities are selling at figures which have not been reached before in 20 years, to help the railroads to rehabilitate themselves when they go back into private management.

Senator Cummins said he had hoped that Congress would adopt such legislation as would enable the railroads to command the credit necessary to meet the exigencies of the coming year, and he was not willing to assume that the railroads could not borrow the money which they unquestionably will need. He did not doubt that their requirements would amount to \$750,000,000, but he was not willing to admit that the legislation which is to be adopted would not make it possible for the railroads to finance themselves without government loans.

"If I did not believe," he said, "that the legislation which will be adopted by Congress would put the transportation system of the United States in position to take care of itself, I would not be in favor of returning the railroads to their present owners. To me the suggestion implies great doubt of the efficacy of the legislation which we are proposing, and inasmuch as I do not maintain a doubt of that character I cannot support the amendment."

At the suggestion of Senator Pomerene, Mr. Frelinghuysen changed his figure to \$500,000,000, and after having been allowed to go over until the next day for further discussion the amendment was adopted by a vote of 28 to 20.

Increase in Rates Necessary

Senator Underwood of Alabama discussed the bill at length on December 16, supporting the bill in general and particularly the provisions designed to improve the credit of the railroads by establishing a rule of rate-making. He also favored the proposed limitation of earnings in order that rates might be made to improve the general condition of the railroads without giving the more prosperous companies earnings which would be regarded as excessive. Senator Underwood declared that unless Congress legislates on the question of railroad transportation at a very early date the entire transportation system of the country will be in danger. He said the President had twice indicated his desire to return the railroads, and he did not believe it is possible to do so under present conditions and without remedial legislation without danger to the business interests of the country. The policy of regulation of railroads in the past has been correct, so far as policy is concerned, but its practical workings, in his judgment, had been a mistake. He thought that freight should be carried at a reasonable rate, but that it was far more important to the shipper to have railroad facilities that will properly put him in contact with his ultimate market than to have cheap freight rates.

He pointed to the fact that wages have been increased by an amount more than all the railroads have ever paid in any year for interest and dividends and that the increased expenses, as well as increases in cost of fuel and materials and supplies, must be paid for some way. "Whether this bill passes or does not pass," he said, "it will be necessary to take up the slack or the railroads cannot run. Even if we do not pass this bill, the Interstate Commerce Commission or the director general must make increases in rates to meet the increased expenditures for labor, for fuel, for the procurement of money, or the railroads cannot run. Such

an increase is going to come whether the bill is passed or whether it is not passed."

Surplus Earnings Questioned

Senator Stanley of Kentucky asked for an explanation of the statements that the railroads have earned a surplus during recent months. Senator Cummins said he had given the matter some investigation, which possibly the Senator from Alabama had not, and that he would answer the question. In the first place, he said, the cost of the general administration has not been charged to operating expenses, and, secondly, the fall months are those in which the net earnings of the railroads are much higher than in other months.

"The statement that a profit has been made is arrived at in this way," said Senator Cummins. "The earnings of the railroad companies for these favorable months have been aggregated and then one-twelfth of the annual compensation has been deducted, with the result stated by those who have occupied the floor. I assume that the fallacy of that kind of computation is at once observable to any student of the subject. The only way in which you can ascertain whether or not a railway is profitable in its operation is to take in the entire year with all of its variations, and I think that when the year is over it will be found that the Railroad Administration for this year has lost more than \$325,000,000."

"Does not the Senator himself know," said Senator Underwood, "that what they gain in October, November and December is not going to be a gain in January, February and March?"

Senator King said he had been informed that the Railroad Administration during the last few months had curtailed necessary expenditures for improvement and maintenance. Senator Underwood said he could not speak by the card on that subject, but that he rides on the railroads sometimes and that it is common knowledge to everybody that rides on the railroads how many freight cars are standing on the side tracks and cannot be used because they are out of repair.

Better Service Under Private Management

Senator Underwood also expressed the opinion that a return to private management would result in better service, saying that there is no one man of sufficient ability to sit in Washington and make all the railroads function as successfully as they could do under presidents, general managers and boards of directors who are interested in the property and have a specific line of road under their observation. It was certain that if Congress would declare a permanent policy of continued control by the government the Railroad Administration would be compelled to increase freight rates, but that, expecting that the roads will be turned back to their owners in January, it was very natural for the administration to try to work through the present condition without an increase in rates. He also declared that the Cummins bill would provide for a very small increase in the income of the railroads. He said the guarantee, based on the earnings of the test period, averages 5.22 per cent on the property investment account, while the bill gives them 5½ per cent on the value of the property as determined by the commission. Assuming that the property investment fairly approximates the value, this would result in an increase of only \$50,400,000, he said, and if the railroads are approaching a condition where they are earning a guarantee, a very slight increase would be needed. "All this talk about a \$4,000,000,000 charge upon the American people, all this talk about a tremendous increase in freight rates under the bill is a mere smoke cloud blown by the enemy to conceal its own operations," he said.

Senator Curtis offered as an amendment a provision for extending the effective date of section 10 of the Clayton anti-

trust law until January 1, 1920, which was adopted. A resolution containing a similar provision had previously passed the Senate but had not passed the House.

Lenroot Criticises Bill

Senator Lenroot also criticized the proposed rate-making which he devoted to a criticism of the Plumb plan and an analysis of the Lenroot-Amster plan for a public corporation to control the railroads as a single system. He objected to many provisions of the Cummins bill, saying that the practical guarantee of an average of 5½ per cent would remove incentive to efficiency and would be unfair to the most efficient roads, and he also objected to the labor provisions of the bill on the ground that the proposed transportation board, because of the nature of most of its functions, would not be so situated as to be an impartial tribunal on wage questions. He also objected to the provisions regarding the temporary guarantee of the standard return on the ground that the roads that would not need such a guarantee could not be required to turn over any surplus to the government. Senator Cummins thought the bill provided a contractual relation created by the acceptance of the guarantee. Senator Lenroot said that a road that expected to make more than the guarantee would not accept any guarantee, and therefore there would be no contractual relation. Senator Cummins said that possibly there was an oversight on the part of the committee in that respect.

Senator Lenroot also criticized the proposed rate-making rule, saying that if, under a system of rates that would produce 5½ per cent of the aggregate value of the property in a district, a road that earned only 2 per cent might go into court and secure an additional increase that would disturb the whole system. Senator Lenroot asked Senator Cummins if he thought it would be entirely safe for the government to say to the railroads that they can operate as many trains as they like, as extravagantly as they wish, and that the government will pay the bills during the period of the temporary guarantee. Senator Cummins said that the bill already provided that the commission in calculating the amount of the guarantee should take into consideration for maintenance expenditures only an amount equal to that provided for in the standard contract, but that the bill might go further and authorize the commission to exclude any operating expenses that ought not to have been incurred. He understood that Senator Curtis had an amendment covering that point which he would offer later.

Senator Lenroot also objected to the provision for a temporary guarantee in the discretion of the transportation board to companies going through a process of consolidation. Senator Cummins thought that this point was of little importance, because the proposed guarantee was only that of the standard return which, based on the earnings of the test period, would be small in relation to the future condition of the railroads. "If there are very many roads," he said, "which do not earn in the years to come the average return of 1915, 1916 and 1917, the transportation of the country will be in a bad way."

On December 17 Senator Lenroot's amendment to eliminate this guarantee during consolidation was adopted.

An amendment by Senator Jones of Washington to limit the authority of the Interstate Commerce Commission over docks and waterway terminals, which would be provided for in the bill, was adopted on December 16.

On December 17 a vigorous effort was made by senators who were anxious to secure consideration of the sugar bill to displace the railroad bill temporarily. Senator Cummins objected to this, saying he thought it would be possible to pass the railroad bill in shorter time than would be required by the sugar bill, and his position was sustained by a vote of 23 to 41.

Senator LaFollette Criticised

Senator Townsend of Michigan delivered a speech in support of the bill on December 17. He said the most bitter opposition to the measure came from a senator who was a member of the committee, and yet during all the weeks of conscientious and full consideration of the bill by the committee he had never heard him make one single constructive suggestion before the committee. This referred to Senator LaFollette. He thought this bill, for the first time in the history of railroad legislation, has for its cardinal principle protection of the people's rights. It has nothing in it which has in view the serving of any special interest. The bill is not what the railroad owners wanted, he said, and a statement to the contrary is in reckless disregard to the facts and the evidence as they have been disclosed. It is not in the interest of the railroad employees, although every one of their rights is protected, in harmony with the same principles which have been applied to owners.

Regarding the labor provisions, he said that six times since he has been in Congress he has introduced bills providing for compulsory investigation of the questions growing out of the controversies between capital and labor. Every time that measure has been opposed by both capital and labor. Yet Mr. Lewis, acting president of the United Mine Workers, in explaining to his followers the agreement which has recently been made with the representatives of the government for the settlement of the questions involved in the coal strike, has stated that the proposal, which is really for compulsory arbitration, was a great victory. "Possibly this particular agreement," Senator Townsend said, "contained other understandings than those submitted to writing, but on its face it is a provision for compulsory arbitration."

He also argued against the Poindexter amendment on the long and short haul clause, and after the conclusion of his speech a vote was taken and it was rejected.

Senator Jones of Washington offered an amendment to strike out section 14, which authorizes the Interstate Commerce Commission to fix minimum rates, because he thought it would hurt the water lines. Senator Ransdell of Louisiana, former president of the National Rivers and Harbors Congress, also supported the amendment, stating that if the commission were given the right to fix minimum rates it might fix such a minimum that shippers could not afford to use the waterways. After various senators had explained that the purpose of the bill was to prevent railroads from reducing rates unduly to kill water competition, the amendment was withdrawn.

The Labor Provisions

An amendment offered by Senator Sterling of South Dakota to strike out of the labor provisions of the bill the word "crafts" an insert in lieu thereof the words "classified employees" was adopted after the senator had explained this was to prevent a possible interpretation of the bill that would give the employees outside of the unions no votes in the nomination of the committee on wages and working conditions, and he submitted another amendment, which was adopted, providing that all classified employees without other distinction shall have the right and opportunity through proper notice to participate in such nominations. Senator Smith of South Carolina offered an amendment to strike out the provision in the bill requiring a certificate by the transportation board before the construction of a new line or the extension of a line can be undertaken.

Senator Stanley again offered his amendment to strike out the labor provisions of the bill, to which Senator McCormick of Illinois offered a substitute to fix a specific time of 90 days during which the committee on wages and working conditions or the regional boards of adjustment will be required to pass on wage questions, and to make it illegal to

call a strike until 60 days after a decision had been made. This, he said, was patterned after a Canadian law, but was intended to correct the principal objection which has been raised to the Canadian law, which does not provide a definite time within which the wage boards must render a decision. He said that the Senate must reckon with the grave improbability that the provision of the bill as reported making strikes illegal can ever become a law.

Amendments proposed by Senator Cummins were adopted on December 16 to include employees of sleeping car companies in the wage provisions of the bill, to insert the words "value of the railroad property" in one place where "property investment" had been inadvertently used, and to provide that through rates for transportation wholly by railroad shall be made for the ordinary transportation service from point of origin to the destination and delivery at the usual unloading places and in the case of live stock destined to public stock yards to include the service of unloading and delivery. This was offered at the suggestion of the American National Live Stock Association.

The amendment offered by Senator Curtis of Kansas to guarantee the short lines relinquished by the Railroad Administration to the extent of any actual operating deficit since January 1, 1918, was adopted on December 16.

The Anti-Strike Provision

Discussing the Stanley amendment to strike out the labor provision, on December 18, Senator Underwood declared that the question of the right of railroad employees to strike goes far beyond the question of labor and capital. So far as railroad labor is concerned, he said, it has no issue with invested capital, because as a practical proposition the wages of labor engaged in railroad industry have long ceased to come out of invested capital. They come out of freight rates and passenger rates as prescribed by the government and the earnings of the roads must come out of the public.

"If that is the case," he asked, "is it fairly stating the proposition to say that labor must still carry this weapon of offense against capital, that the value of its wage must be determined on the battle ground between labor and capital, and then after the battle is fought and won the result of the victory must be assessed against the public, which has had no interest or no hand in the dispute? But it does not even stop there. The public are not only required to pay the bill, but they must bear the burden of the fight. The reservation to labor of the right to strike is either an actual fact, a weapon that is poised on its way to the blow, or it is a mere theory and is of no value."

Senator Thomas of Colorado and Senator Stanley delivered the principal speeches on the anti-strike provisions, although a large number of senators participated in the debate. Senator Thomas pointed out that the total number of men who went on strike in the United States during the war exceeded the total number of soldiers sent to France by about 350,000 men. The total number of strikers, he said, was 2,386,285, while the total number of men sent to France was 2,053,347. Senator Thomas said the increases in wages granted by the Railroad Administration could not be considered excessive, but that there were excessive instances. He told a story of an instance on the Wabash Railroad, which, he said, had formerly paid a farmer \$20 a month for turning on and off a switch in a water tank operated by electricity, who had been classified by the Railroad Administration as an electrician, paid for his entire day at the rate of about \$300 a month and given over \$2,500 back pay.

This, however, was denied in a letter sent to the Senator by Director General Hines, which he inserted in the record later. Mr. Hines said the statement had been circulated some time ago, at which time he challenged and denied it, but the untrue statement continues to receive currency. He

said he had been unable to find anything in the wage transactions of the Railroad Administration which resembled the statement in any respect and that such a case could not have been evolved from the principles of wage adjustment adopted by the Railroad Administration.

Senator Stanley's amendment was defeated by a vote of 46 to 25, after which Senator McCormick's substitute amendment to prohibit strikes until after 60 days after a decision by the wage board was defeated by a tie vote of 31 to 31. On the following day a separate vote was taken on the Stanley amendment, and it was again defeated by a vote of 39 to 24, while Senator McCormick's substitute was again defeated by a vote of 30 to 33.

Senator Pomerene offered an amendment authorizing the transportation board to require carriers to furnish sufficient refrigerator cars for the transportation of fresh meat, but later withdrew it after it had been pointed out that this in effect would require the railroads to purchase the cars owned by the packers and would probably require another revolving fund to enable them to do so.

An amendment proposed by Senator Smith of South Carolina to strike out the provision requiring a certificate of public interest for the construction of new lines was defeated by a vote of 23 to 44. The senator argued that the provision would prevent the development of new or sparsely settled territory by the construction of local lines. Senator Cummins expressed the opinion that the passage of his bill would do more to encourage and promote the building of railroads into undeveloped parts of the United States than anything that has been suggested for years.

Senator Jones of New Mexico offered an amendment to include within the things to be considered by the commission in fixing rates the requirements for additional capital to encourage needed new construction, which was rejected. Two other amendments intended to facilitate new construction were also rejected.

Senator Myers of Montana proposed to increase the proportion of so-called excess earnings which may be retained by a carrier prior to the building up of its reserve fund from one-half to two-thirds of the net operating income between 6 and 7 per cent, but it was rejected without a record vote.

Senator Smith of Georgia introduced an amendment, which was adopted, to continue the effect of the amendment to the fifteenth section of the commerce act requiring the permission of the commission for the filing of a tariff containing an increased rate, which was adopted at his proposal in 1917, but which by its terms expires on January 1, 1920.

Senator Pomerene offered another amendment, which was agreed to, authorizing the transportation board to require any carrier to furnish refrigerator cars for the transportation of vegetables, fruits and fresh meats and such other perishable commodities as require a refrigerator service, but also authorizing it to expend, if the revenue of the carrier is inadequate for that purpose, a portion of the revolving fund therefor. It was provided, however, that this provision shall not in any wise relieve common carriers from their duty to furnish such refrigerator cars as are required for the transportation of vegetables, fruits, fresh meats and other perishable commodities.

Senator Walsh of Massachusetts offered an amendment which he said was intended to guarantee to the railroad employees reasonable wages. It provided for the stabilization of wages less than \$3,000 a year by an adjustment in accordance with the average cost of living as determined by the Bureau of Labor Statistics quarterly, providing nothing in the provision should operate to reduce wages below the amount to which the employees were entitled in December, 1919. The amendment was rejected.

Senator Chamberlain of Oregon opposed the passage of the bill, saying that whereas in 1916 the railroad brother-

hoods were accused of demanding the passage of the Adamson law at the point of a gun, the railroad owners and the security holders are now demanding that Congress pass a bill at once and in a hurry to prevent the railroad companies going into bankruptcy. "Instead of the labor men holding the gun and sitting in the galleries looking down upon Congress," he said, "the railroad presidents, managers and their representatives are sitting in the galleries looking down upon Congress and insisting—what? Not only that their rates shall be increased but that we shall grant them large sums of money out of the treasury of the United States and out of the pockets of the taxpayers. Whose ox has been gored this time, Mr. President, and who will ring the changes now or in the coming campaign?"

Senator King remarked that, aside from those that had come from those favoring the Plumb plan, the only communications he had received opposed to the legislation were from those who owned railroad securities. The only railroad executive in the gallery at the time was S. Davies Warfield, who is chairman of the Seaboard Air Line, but who is also president of the National Association of Owners of Railroad Securities, which has been strongly supporting the bill. Senator Cummins said he did not know of a railroad president in the United States who is in favor of the bill, and he did not believe that the Senator from Oregon knew of any. "On the contrary," he said, "so far as I know, they all protest against its provisions. It has been asserted here a great many times that this is a bill made up by the railroad companies, but if any senator knows of a single railway executive who is favoring this bill I should like to hear him named."

Senator Chamberlain said he had not taken the trouble to inquire, to which Senator Cummins replied:

"The senator from Oregon has just asserted that railroad presidents were looking down upon the Senate insisting upon the passage of this bill. Now, that is not accurate, whatever else may be true. It is true that an association of bondholders, or some part of it, believes that this bill ought to be passed."

Senator Ransdell offered an amendment striking out the provision authorizing the commission to prescribe minimum rates, and also another declaring that the commission shall have no authority to establish any route, classification, rate, fare or charge when the transportation is wholly by water. These were adopted after Senator Cummins had said that he did not think the commission was given the power to establish such a rate by water and that the provision regarding minimum rates was included in the House bill, so that the whole question could go to conference in any event.

Senator Henderson of Nevada introduced a new amendment designed to restore a rigid long and short haul clause, which was lost by a tie vote, and Senator Poindexter secured another vote on his amendment to strike out the provision authorizing the commission to grant exceptions, which was also rejected.

Senator Brandegee of Connecticut offered an amendment to create a board of adjustment to adjudicate disputes between the government and the railroad companies growing out of the contracts entered into under the federal control act, but it was rejected.

An amendment by Senator Thomas of Colorado was adopted providing that passenger tickets, excepting special rate tickets for excursions, conventions, etc., shall not be limited and shall be honored when presented in payment for passage by any lawful owner thereof.

Senator King of Utah offered an amendment to strike out the rate-making section of the bill and to substitute for it a rule that rates by groups shall from time to time be adjusted by the Interstate Commerce Commission, so as to provide revenue sufficient to pay the wages of labor and all other

expenses of operating, including taxes, to earn proper current capital charges, to maintain necessary funds for repairs, replacements and working operations and establish credit sufficient to attract the new capital required to meet the public need for present and reasonable prospective transportation facilities and service. The amendment also provided that in applying the foregoing rule a comprehensive view of the conditions of each rate-making group shall be taken and the level of rates, fares and charges shall be determined with reasonable reference to railroads fairly representative of average conditions therein. In support of his argument for this amendment, Senator King presented part of the argument against the rate-making provisions of the Cummins bill recently published by Judge Lovett. The amendment was rejected without a record vote.

La Follette Delays Passage

It was expected that the bill would be passed at a late session on Friday night, but after it had been voted 41 to 17 to substitute the Senate bill for the House bill, Senator LaFollette offered as a substitute a provision for an extension of the present system of federal control for two years, prohibiting the relinquishment of the railroads prior to that time by the government or by any officer or agent thereof. Senators Sheppard of Texas and Kirby of Montana spoke in favor of this proposal, and a vote was about to be taken when Senator LaFollette announced that he had a few remarks to make. It had been understood that Senator LaFollette had promised not to filibuster against the passage of the bill when it became apparent that the Senate would refuse to adopt any amendments to the labor provisions, and therefore that there were no provisions in the bill which the labor organizations desired to insist upon, but Senator LaFollette did want to make a speech on the two-year extension which has been demanded by organized labor. He did not want to make the speech that night, however, as he had a bad cold, and he appeared to be able to speak only with great difficulty. After it had become apparent, however, that he proposed to hold the floor unless the bill could be postponed until the following day, a unanimous consent agreement was arranged providing for a final vote on the passage of the bill not later than 3:30 p. m. on Saturday, whereupon Senator LaFollette allowed his speech to be interrupted. This gave him, however, four hours on Saturday, which he devoted to an impassioned denunciation of the bill and of the railroads generally, after which his amendment was voted on and defeated and the bill was adopted without further formality.

The conferees were immediately appointed both in the Senate and in the House. In the House Representative Meade proposed a motion to instruct the House conferees to insist on the retention in the bill of the Anderson amendment, including the labor provisions. At the request of Mr. Esch, who asked that the conferees be left unhampered, he agreed to withhold the motion. Mr. Esch said that in view of the fact that the labor provisions are so radically different in the two bills it is almost certain that the conferees may have to go back to the House for further instructions.

The conferees held their first session on the bill on December 23 and another on December 24, after which they adjourned until Monday, December 29.

THE RAILROAD COMMISSION OF CALIFORNIA, in the year ending June 30, 1919, investigated 54 accidents. The commission requires the railways to examine the qualifications and physical fitness of employees in train and engine service, and has required the smaller companies to operate their roads in accordance with rules and methods which have been found to be most satisfactory by other companies.

Roads Will Be Returned March 1

PRESIDENT WILSON on Wednesday evening, December 24, issued the following proclamation concerning the relinquishment of federal control of railroads and systems of transportation:

"Whereas, in the exercise of authority committed to me by law I have heretofore, through the Secretary of War, taken possession of, and have, through the Director General of Railroads, exercised control over certain railroads, systems of transportation and property appurtenant thereto or connected therewith, including systems of coastwise and inland transportation and property appurtenant thereto or controlled by said railroads or systems of transportation; including also terminals, terminal companies and terminal associations, sleeping and parlor cars, private cars and private car lines, elevators, warehouses, telegraph and telephone lines and all other equipment and appurtenances commonly used upon or operated as a part of such railroads and systems of transportation; and,

"Whereas, I now deem it needful and desirable that all railroads, systems of transportation and property now under such Federal control be relinquished therefrom,

"Now, therefore, under authority of Section 14 of the Federal control act approved March 21, 1918, and of all other powers and provisions of law thereto me enabling, I, Woodrow Wilson, President of the United States, do hereby relinquish from Federal control, effective the first day of March, 1920, at 12:01 o'clock a. m., all railroads, systems of transportation and property of whatever kind taken or held under such Federal control and not heretofore relinquished, and restore the same to the possession and control of their respective owners.

"Walker D. Hines, Director General of Railroads, or his successor in office is hereby authorized and directed, through such agent and agencies as he may determine, if in any manner not inconsistent with the provisions of said act of March 21, 1918, to adjust, settle and close all matters, including the making of agreements for compensation, and all questions and disputes of whatsoever nature arising out of or incident to Federal control, until otherwise provided by proclamation of the President or by act of Congress. And generally to do and perform as fully in all respects as the President is authorized to do, all and singular the acts and things necessary or proper in order to carry into effect this proclamation and the relinquishment of said railroads, systems of transportation and property.

"For the purposes of accounting and for all other purposes this proclamation shall become effective on the first day of March, 1920, at 12:01 a. m.

"In witness whereof I have hereunto set my hand and caused the seal of the United States to be affixed.

"Done by the President, through Newton D. Baker, Secretary of War, in the District of Columbia, this 24th day of December, the year of our Lord one thousand nine hundred and nineteen, and of the independence of the United States of America the one hundred and forty-fourth."

A similar proclamation was also issued relinquishing the American Railway Express Company.

FORTY-ONE YEARS AT THE THROTTLE without one accident to mar his work is the remarkable record established by Lew Patrick, as reported by the Canadian Pacific. Up to October 31, 1919, Mr. Patrick was an engineman, running trains out of Revelstoke on the mountain division. He is one of the pioneers who went west with the railroad, starting at St. Boniface, Manitoba, when a young man of twenty-five years. From June, 1896, to the spring of 1918, Patrick was a runner on the Imperial Limited passenger trains.

General News Department

J. L. Truden, general superintendent of the Boston & Albany, has received from the King of the Belgians a medal of the Order of Leopold II, presented in appreciation of the efficiency with which King Albert's train was managed while moving over the Boston & Albany line.

The Kansas City Northwestern, having ceased to operate trains, as ordered recently by the United States District Court, Eastern District of Kansas, the court has ordered Jay M. Lee, the newly appointed receiver, to discharge all operating employees, retaining only the office men in the legal, auditing and grain departments.

The Twentieth Century Limited express train of the New York Central, and the Broadway Limited of the Pennsylvania were put in service on December 20, following the ten-days' suspension of their trips because of the scarcity of coal and the disturbance in freight traffic. The restoration of these trains completed the return to normal timetables on all lines east of Chicago.

E. C. Davidson, secretary-treasurer of the International Association of Machinists, has been quoted as saying that nearly 100 per cent of the members of the organization have voted in favor of a strike if the anti-strike provisions of the Cummins bill are adopted by the Senate, and that there will be a general strike of railroad employees, except possibly the enginemen, conductors and firemen, if the bill goes through.

Engineering Council recently mailed to 50,000 engineers an appeal for funds to carry on its work. This extraordinary measure was necessitated by present financial conditions resulting from the war. Engineers are expecting much of the council and commending the work which it has done. In order, however, that the council may continue its work for professional welfare and civic service, not less than \$45,000 is needed for 1920. Of this amount, \$30,000, at least, must come from general contributions. To December 16, 550 contributions have been received, totaling \$3,843. They range from one dollar to \$100 each and average \$7.

The Illinois Southern Railroad, extending from Salem, Ill., southwest 127 miles to Bismarck, Mo., has ceased operation, under an order entered on December 11 by Federal Judge George Carpenter in the United States District Court at Chicago. The order was issued at the request of W. W. Wheelock, receiver of the property, after foreclosure proceedings had been started by the bondholders, represented by the Chicago Clearing-House Association. The railway was capitalized at \$5,000,000 and is asserted to have lost \$100,000 in the recent past, struggling to operate against financial odds. It has been losing money for two years and has paid no interest on its bonds. The recent coal strike produced complete insolvency, as the road derived its main traffic from the Illinois coal fields.

The Safety Section, Division of Operation, of the United States Railroad Administration reports for the month of September 193 railroad employees killed and 11,887 injured, as compared with 261 killed and 12,476 injured in September of last year. The number of meetings of safety committees held in September on the railroads under federal control was 1,888, with an attendance of 28,935. The number of men who, during the month, received instruction or advice on safety matters either by attending meetings or by being spoken to individually by committee-men was 183,383; and 160,320 safety bulletins, circulars, etc., were distributed. Other safety "literature," including magazines, etc., in addition to the foregoing, was distributed to the number of 1,108,189

copies. For the first nine months of 1919 the total net decrease in casualties, reported by regions, was, for the whole country, 1,002 employees killed, and 23,986 injured; or, in round numbers, and crediting the safety committees with the whole of the saving in life and limb, 25,000 personal injuries prevented. A. F. Duffy, manager of the Section, urges safety supervisors to be careful not to allow discussion of the possible change in the management of the railroads to have any influence in relaxing activities for safety.

The fire insurance men are preparing to renew business with the railroads when the lines are returned, according to the New York Journal of Commerce. Notwithstanding the doubt as to the return of the railroads to private ownership on January 1, the underwriters are preparing to re-enter the field closed to them when the Government took over the railroads. The premiums paid by the railroads to the fire insurance companies before the Government took control have been estimated all the way from \$10,000,000 to a much larger sum. Considerable organization work will be necessary before the insurance companies can take up the railroad lines again, but the underwriters propose to be ready. Many of the inspectors, and in some cases entire organizations, went over to the Government when the roads were transferred, and these it is expected will come back.

Public Ownership League Wants Railroads Retained

A petition bearing 22,000 signatures secured by the Public Ownership League in 38 states, protesting against the return of the railroads to private management, was filed in Congress on December 20 by Representative Sinclair of North Dakota. On the back of the sheets bearing the signatures was the following statement.

"Keep the railroads. The people have bought and paid for them twice over. The people should own and operate them. The people of this nation have invested more than \$900,000,000 in rehabilitating the railway system that private ownership had so exploited and plundered and mismanaged that it was utterly inadequate.

"The people have invested another \$975,000,000 in improving labor conditions and pulling the railroads out of an impossible situation that private ownership had created.

"The government has rehabilitated the dilapidated system, unified it, effected numerous economies and guaranteed the private owners their usual dividends. And yet they are not satisfied. They want the railroads back again for further exploitation and plunder. We protest."

Disastrous Collision at Onawa, Me.

In a butting collision between an immigrant train and a freight, on the Canadian Pacific, near Onawa, Me., at 7:15 on the morning of the 20th of December, 19 passengers and four trainmen were killed, and 35 passengers were injured, some of the killed being burned to death, and some of the injured severely burnt before they could be rescued. The enginemen and firemen of both trains were killed.

Onawa is about 50 miles northwest from Bangor, and lies between two junctions of the Canadian Pacific with the Bangor & Aroostook, Greenville about 15 miles to the west, and Brownville Junction, about 20 miles to the east. Trains were sent over the Bangor & Aroostook until the track was cleared.

The immigrant train, carrying about 300 passengers, was the fourth section of westbound passenger train No. 39, and the freight was an eastbound extra. Both locomotives were wrecked and the freight engine crashed through the first two coaches of the passenger train. The wreck took fire from coals in the fireboxes. The freight had met the third section of the passenger train at Bodfish, one mile west of Onawa, and should have waited there for the fourth section. The temperature at the time of the collision was about 20 deg. below zero.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight	Passenger	Total	Maintenance of way and structures.	Equip. ment.	Traffic.	Trans- portation.				
Ft. Worth & Rio Grande.....	235	99,063	69,511	168,574	34,743	20,178	2,419	80,911	78.61	2,983	36,741	72,388
Galveston, Harrisburg & S. Ant.....	1,381	1,402,753	413,920	1,816,673	37,743	20,178	2,419	80,911	72.42	52,892	47,501	-70,805
Galveston, Harb. & S. Ant.....	13	1,402,753	413,920	1,816,673	37,743	20,178	2,419	80,911	100.00	12,500	-12,500	-3,469
Georgia R. R.....	328	531,631	145,373	677,004	66,018	23,766	8,300	276,791	66.84	239,973	5,950	-20,451
Georgia R. R.....	328	531,631	145,373	677,004	66,018	23,766	8,300	276,791	148.98	4,886	4,200	-34,290
Georgia R. R.....	402	236,898	95,351	332,249	76,242	96,746	5,440	189,679	102.02	13,733	-21,647	11,400
Grand Rapids & Ind.....	569	585,288	172,652	757,940	81,210	79,309	9,857	352,363	80.01	162,354	25,126	440,726
Grand Rapids & Ind.....	1,001	1,724,259	299,581	2,023,840	269,759	139,527	18,315	945,078	64.93	115,678	716,544	151,320
Grand Trunk W. in N. E.....	1,172	1,686,662	33,131	1,719,793	113,646	34,261	2,952	113,103	129.47	-66,405	80,905	-435,917
Grand Trunk W. in N. E.....	8,171	9,119,284	1,750,420	10,869,704	1,359,854	1,797,110	54,716	4,210,652	66.98	3,892,835	3,108,962	3,394
Great Northern.....	252	110,798	16,355	127,153	24,784	30,154	805	46,329	76.75	31,473	27,053	45,326
Green Bay & Western.....	307	159,348	45,553	204,901	58,796	57,338	3,783	103,282	104.31	11,408	30,677	230,677
Gulf, Colo. & S. F.....	1,937	1,664,200	565,714	2,229,914	499,520	351,727	21,834	775,944	71.80	662,318	71,166	590,224
Gulf, Colo. & S. F.....	467	240,709	50,309	291,018	70,031	63,521	3,518	114,369	86.08	11,866	30,620	27,609
Gulf, Mobile & Northern.....	350	1,212,550	126,777	1,339,327	148,174	150,753	5,779	414,348	68.21	450,949	400,449	-96,449
Hocking Valley.....	547	725,991	238,924	964,915	188,181	196,753	3,543	372,343	72.56	280,709	34,458	50,560
Houston & Texas Central.....	190	160,942	46,022	206,964	39,870	41,414	883	109,573	89.40	23,243	16,706	-10,849
Houston, E. & W. Texas.....	4,799	8,013,938	2,060,099	10,074,037	1,916,941	2,927,290	75,052	4,121,504	86.45	1,439,198	457,487	998,412
Ill. Cent.....	116	956,650	315,477	1,272,127	153,717	125,799	1,813	783,285	121.40	-137,946	147,901	20,778
Ind. Harbor Belt.....	1,159	956,650	315,477	1,272,127	153,717	125,799	1,813	783,285	107.05	-96,320	23,500	-400,313
Int. & Great Northern.....	176	412,736	50,963	463,699	68,099	155,107	3,543	144,438	80.57	92,712	18,988	-204,702
Int. & Great Northern.....	272	124,936	17,397	142,333	52,690	52,542	2,092	90,907	138.25	-56,851	6,250	-609
Kan. City, Mex. & Orient.....	465	113,682	25,119	138,801	34,838	58,863	2,131	84,632	129.49	5,000	47,824	-476
Kan. City, Mex. & Orient of Texas.....	774	1,108,209	222,526	1,330,735	189,594	277,316	9,295	492,406	68.68	458,260	61,250	396,603
Kansas City Southern.....	27	880,221	62,980	943,201	154,735	178,774	11,380	368,506	89.62	15,156	24,475	-9,319
Kansas City Terminal.....	902	776,046	214,441	990,487	154,735	178,774	11,380	368,506	74.12	257,580	46,700	211,860
Lake Erie & W. Is. Sumping.....	34	86,032	158	86,190	18,209	14,599	192	13,358	58.39	40,542	3,872	36,670
Lake Superior & Hudson.....	96	297,304	4,158	301,462	28,480	52,832	1,610	18,943	89.59	102,601	7,866	94,734
Lehigh & N. England.....	234	430,155	1,679	431,834	72,652	76,823	1,959	18,943	65.96	153,003	7,380	83,213
Lehigh Valley.....	1,435	5,257,787	524,374	5,782,161	1,056,340	1,790,953	35,964	2,580,143	89.81	632,622	163,000	-359,672
Long Island.....	398	653,260	984,944	1,638,204	227,673	399,483	17,350	1,055,854	95.51	83,271	94,428	172,896
Long Island & Salt Lake.....	1,168	1,102,299	374,899	1,477,198	1,577,113	315,954	18,090	540,985	67.93	505,775	69,473	-29,227
Los Angeles & Salt Lake.....	302	121,585	47,899	169,484	178,349	76,507	2,082	109,326	83.07	20,718	11,216	-38,412
Los Angeles & Salt Lake.....	207	278,880	108,659	387,539	68,440	93,295	4,534	109,326	52.91	192,261	183,381	8,486
Los, Ry. & Nav. Co.....	207	278,880	108,659	387,539	68,440	93,295	4,534	109,326	80.07	2,082,520	260,773	251,184
Louisville & Nash.....	5,013	7,736,046	2,147,441	9,883,487	1,385,029	2,537,661	129,411	3,858,776	80.75	192,713	4,000	-3,079
Louisville & Nash.....	199	736,216	62,520	798,736	44,657	40,413	4,368	107,772	101.19	80,680	99,811	24,117
Low, Henderson & St. L.....	1,216	1,099,239	376,759	1,475,998	355,886	406,413	12,868	797,303	93.03	8,502	6,608	449,219
Maine Central.....	82	89,108	36,728	125,836	12,035	9,814	2,275	2,562,295	66.45	2,622,762	285,000	2,337,559
Md., Del. & V.....	1,861	5,353,517	1,741,039	7,094,556	829,265	1,437,759	58,475	2,562,295	66.45	2,622,762	285,000	2,337,559
Michigan Central.....	390	281,539	95,258	376,797	106,760	81,160	9,106	150,385	94.93	19,823	9,500	-68,249
Midland Valley.....	101	59,579	213	60,792	13,631	17,720	320	28,465	97.31	1,687	3,036	9,307
Min. & Int. Ry. & Sault Ste. Marie.....	4,243	3,478,868	728,978	4,207,846	619,304	958,745	23,440	1,753,046	76.96	1,032,489	24,936	790,146
Minn. & Int. Ry. & Sault Ste. Marie.....	164	49,924	27,844	77,768	18,344	17,979	470	42,839	89.92	10,480	4,158	-3,962
Mississippi Central.....	164	72,137	28,111	100,248	23,212	24,517	1,349	38,435	98.92	2,800	7,633	2,456
Mo. & North Arkansas.....	365	102,116	51,018	153,134	48,709	37,641	1,609	64,047	98.01	3,224	6,242	19,387
Mo., Kan. & Texas.....	1,713	2,566,911	666,085	3,232,996	470,733	914,552	41,640	1,044,843	79.01	678,923	59,835	618,883
Mo., Kan. & Texas.....	1,796	1,353,371	833,509	2,186,880	555,106	541,732	27,678	1,267,473	99.06	23,721	82,255	-58,913
Mo., Kan. & Texas.....	332	172,401	21,668	194,069	86,643	68,280	1,915	89,424	119.89	-42,124	8,500	-50,711
Mo., Okla. & Gulf.....	7,301	6,985,201	1,790,303	8,775,504	1,930,598	1,877,596	86,275	3,586,867	82.38	1,655,836	271,374	1,381,496
Mo., Okla. & Gulf.....	997	1,343,508	183,946	1,527,454	330,644	478,522	25,724	675,843	96.82	51,088	40,000	10,783
Mo. Pacific.....	108	335,840	23,231	359,071	368,731	34,923	701	103,040	53.84	170,203	5,000	165,202
Monongahela Ry.....	6	155,484	1,206	156,690	198,914	30,060	525	88,343	94.22	11,484	1,568	9,916
Montour.....	400	553,819	172,162	725,981	113,552	114,261	935	33,761	87.38	20,833	1,452	23,288
Morgan's La. & Tex.....	1,247	1,296,179	447,244	1,743,423	1,858,640	313,416	994	43,665	65.63	263,889	29,797	233,623
Nash, Chatt. & St. L.....	168	142,506	11,145	153,651	27,348	34,397	0,010	225,061	70.35	47,045	9,100	37,945
Nevada Northern.....	195	347,826	123,627	471,453	106,761	142,317	1,782	91,110	95.80	8,041	21,727	11,214
New Orleans & N. E. Northern.....	284	131,732	51,743	183,475	38,573	42,548	2,427	26,880	56.48	99,987	10,000	89,976
New Orleans Central.....	191	180,483	42,052	222,535	49,216	211,055	8,919	307,911	77.00	6,716,047	1,131,648	-273,666
New Orleans, Texas & Mex.....	6,075	18,763,994	6,841,685	25,605,679	3,188,780	6,709,220	229,374	11,243,750	77.00	6,716,047	1,131,648	-273,666
New York Central.....	574	1,794,228	92,016	1,886,244	253,084	337,252	25,445	834,301	78.07	428,981	30,000	398,955
New York, Chicago & St. L.....	1,965	5,258,693	3,882,319	9,141,012	1,318,514	1,919,899	35,158	4,566,954	102.24	-20,083	30,000	1,692,762
N. Y. N. H. & Hartford.....	129	618,226	128,193	746,419	178,223	271,490	8,919	307,911	84.69	11,595	23,306	88,589
N. Y. N. H. & Hartford.....	561	586,432	98,119	684,551	67,816	211,055	8,919	307,911	92.37	27,475	40,700	-13,241
N. Y. N. H. & Hartford.....	135	261,088	60,102	321,190	71,682	44,722	2,104	205,065	319.94	7,174	7,174	-93,920
N. Y. Susq. & Western.....	2,088	6,267,635	878,573	7,146,208	993,936	1,397,397	38,191	2,656,777	81.32	1,392,931	260,000	1,132,482
Norfolk & Western.....	906	1,177,808	218,561	1,396,369	122,345	100,634	10,707	276,880	79.90	13,081	16,000	91,177
Norfolk Southern.....	1,646	1,177,808	218,561	1,396,369	122,345	100,634	10,707	276,880	82.83	250,681	45,519	204,706
Min. & St. Louis.....	1,646	1,177,808	218,561	1,396,369	122,345	100,634	10,707	276,880	82.83	250,681	45,519	204,706

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—Total				Operating expenses				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	(inc. misc.)	Maintenance of way and structures.	Equip- ment.	Traffic.	Trans- portation.	General.				
Northern Pacific	6,610	8,152,980	1,850,735	10,703,040	1,391,114	1,695,396	63,363	3,600,375	193,574	7,020,168	3,683,872	2,945,797	-1,960,169
Northern Western Pacific	538	417,149	192,156	673,861	127,991	76,239	4,547	254,748	14,221	479,748	194,113	168,408	13,241
Northern Alabama	112	101,544	14,685	118,875	25,032	5,843	1,485	58,960	1,510	92,830	25,647	21,745	-44,607
Oregon Short Line	2,347	3,102,979	623,365	3,951,560	253,137	470,522	16,072	1,033,380	103,629	1,935,348	1,843,982	1,843,982	693,081
Oregon-Wash. R. R. & Nav.	2,070	2,053,951	575,921	2,825,629	403,171	413,155	27,384	1,114,946	90,173	2,068,137	1,113,614	642,917	190,398
Panhandle & Santa Fe	772	529,051	143,031	701,129	68,821	173,660	4,275	268,077	14,376	529,139	171,991	150,952	195,343
Penn. R. R. West	1,754	8,090,784	1,632,256	10,607,011	1,878,051	2,863,195	75,544	4,163,271	204,354	9,270,078	3,356,222	979,718	-150,424
Penn. R. R. East	5,367	24,653,899	8,129,213	36,030,244	5,253,547	10,581,019	240,980	15,338,002	765,844	32,876,714	3,153,530	2,272,098	-1,025,069
Penn. & P. U.	19	30,613	1,609	151,111	23,584	42,923	621	79,596	5,689	152,414	1,282	10,782	28,067
Pere Marquette	2,230	2,752,940	501,856	3,539,290	250,159	637,926	29,927	1,338,778	98,674	2,364,920	1,174,870	62,475	346,065
Perkion	41	90,565	5,509	99,137	8,445	4,429	13	34,796	236	47,942	51,195	49,768	-7,655
Phila. & Read	1,127	5,787,324	1,081,752	7,277,755	794,483	1,631,665	38,537	3,236,739	141,036	5,876,609	1,410,466	1,266,805	1,067,230
Phila., Bethlehem & New England	71	1,005,906	230,010	1,235,916	10,626	13,469	949	54,293	5,534	138,045	1,100	954	-17,920
Pitts. & Lake Erie	224	1,905,906	230,010	2,286,073	255,194	820,885	19,331	860,705	46,134	2,003,860	283,213	211,212	-94,507
Pitts. & W. Va.	63	118,117	9,364	139,348	35,775	51,440	989	61,996	6,849	161,043	11,467	36,162	28,715
Pitts. & Shawmut	103	126,010	4,007	132,435	26,911	42,065	1,108	42,976	2,872	115,932	16,504	15,506	51,532
Pitts., Inc., Chicago & St. Louis	204	6,346,277	1,798,203	8,930,380	1,621,699	3,197,685	99,716	3,811,813	202,164	9,015,361	83,981	345,373	1,440,327
Port Reading	21	132,039	.....	132,039	27,117	50,147	949	54,293	5,534	138,045	1,100	954	-17,920
Quincy & Omaha & Kansas City	255	69,348	.....	103,439	38,903	32,275	18	95,416	46,134	167,842	27,051	18,229	-70,210
Rich., Fred. & Pot.	81	269,034	283,013	612,029	48,748	101,844	3,385	224,772	14,449	395,967	216,061	13,135	-90,917
Rutland	415	257,512	111,847	455,546	85,788	104,497	4,202	198,560	12,012	406,736	38,510	19,559	84,127
St. Joseph & G. I.	288	228,367	49,850	280,368	60,145	55,120	2,689	142,416	14,250	274,620	97,94	11,853	-35,056
St. L., Brownsville & Mex.	548	363,139	143,387	526,526	144,077	82,168	4,233	148,432	16,042	349,950	142,266	10,000	-80,331
St. L. Merchants Bridge Term.	9	458,423	158,660	663,972	224,416	61,038	7,763	242,670	7,127	354,330	96,44	8,000	17,662
St. L. & San Francisco	4,761	5,214,718	2,028,597	7,662,183	1,394,794	1,376,088	61,998	2,724,927	175,735	5,725,113	1,937,070	208,091	406,803
St. L. Transfer	6	.....	116,191	116,191	13,851	124	55,368	124	2,203	82,091	34,100	143	33,958
St. L., San F. & Texas	134	96,781	27,465	138,792	37,344	12,203	1,814	72,241	4,201	129,892	8,900	7,265	17,381
St. L. Southwestern	939	967,425	203,576	1,236,245	224,705	226,487	15,221	324,549	7,525	433,370	433,370	395,555	341,176
St. L. Southwestern of Texas	814	458,423	158,660	663,972	224,416	61,038	9,348	327,841	17,714	781,652	117,72	21,000	28,765
San Ant. & Aransas Pass	736	276,420	132,231	437,230	138,079	132,466	7,096	207,340	17,739	502,694	65,464	15,000	-145,723
Seaboard Airline	3,563	2,405,699	926,199	3,657,285	603,227	806,632	70,801	1,609,637	97,385	3,213,496	443,789	307,922	69,757
Seaboard Buffalo	11	12,429	.....	52,820	8,000	13,629	465	19,967	1,414	43,475	9,346	3,667	-25,474
Southern	6,982	8,435,466	2,262,107	12,456,555	2,272,631	2,820,295	136,973	3,159,387	288,121	10,771,424	1,583,132	1,222,070	-2,339,692
Southern in Miss.	278	136,533	52,402	201,752	49,965	23,605	2,385	83,889	4,683	164,527	37,225	9,000	21,058
Southern Pacific	7,049	12,176,786	4,055,087	17,567,995	1,670,576	2,972,394	150,407	5,855,603	266,773	11,193,237	6,372,758	350,022	758,657
Southern Pac. S. S. Lines .....	.....	616,758	60,119	694,767	11,375	87,704	13,883	618,713	22,387	754,062	59,295	69,316	-183,700
Spokane International	156	116,821	17,473	137,041	31,505	10,320	2,081	44,162	4,598	92,513	40,513	4,012	10,494
Spokane Port & Seattle	538	526,182	153,839	724,015	109,628	69,104	7,283	224,916	21,853	435,366	288,649	59,200	-68,874
Staten Island Rapid Transit	23	91,974	70,057	182,775	28,013	28,013	1,626	98,848	9,627	167,637	15,138	20,000	-12,806
Tennessee Central	292	162,321	45,463	219,272	51,578	43,648	3,235	112,619	5,765	216,844	2,427	5,136	-8,541
Terminal R. R. Assn. of St. L.	36	.....	1,600	1,600	54,281	63,372	906	190,186	3,641	315,619	98,888	66,453	69,478
Texas & N. E.	87	132,742	20,360	163,624	16,947	25,515	498	54,835	3,320	100,741	62,883	6,458	12,197
Texas & Pacific	469	513,209	168,499	751,751	167,900	237,494	3,981	239,868	13,546	696,269	21,356	33,660	14,824
Toledo & O. Central	435	898,380	71,405	1,018,874	135,906	242,307	6,515	402,485	17,600	807,973	30,014	180,897	-53,062
Toledo, Peoria & Western	247	108,834	49,711	169,327	37,815	48,078	2,007	78,757	4,783	171,379	101,21	10,553	1,597
Toledo, St. L. & Western	454	744,660	33,430	827,617	142,565	176,188	6,281	314,489	11,188	650,620	176,997	146,973	-48,985
Trinity & Brazos Valley	368	116,935	24,493	146,935	63,913	63,913	2,032	60,865	5,533	183,742	12,151	47,338	10,351
Union R. R. of Penna.	40	9,312,192	1,897,190	11,825,306	1,427,680	1,976,728	51,795	3,135,115	246,994	7,067,824	4,757,432	329,384	-577,163
Utah Ry.	98	139,389	138,113	277,502	14,318	25,076	182	25,740	2,642	67,959	70,154	5,052	-3,389
Vicks., Shreveport & Pacific	171	205,945	97,422	325,255	55,597	68,397	10,571	106,579	17,218	261,661	63,593	43,302	347,939
Virginian	523	1,178,972	60,171	1,363,916	175,646	262,691	4,506	425,132	18,107	884,148	479,768	455,107	287,939
Wabash Ry.	2,563	3,919,805	892,527	5,855,114	873,377	934,443	57,215	2,144,144	119,164	4,152,265	1,032,849	920,650	-64,699
Wash. Southern	35	99,563	172,805	352,315	29,106	44,093	7,329	111,488	6,151	194,207	163,308	156,925	-26,893
W. Jersey & Seashore	361	352,600	475,363	900,029	174,109	180,075	4,437	507,381	21,556	806,091	3,538	52,025	-155,919
Western Maryland	659	1,273,809	97,800	1,485,966	234,915	517,528	18,784	599,258	30,566	1,405,354	47,412	37,412	-485,724
Western Pacific	1,042	1,476,324	282,679	1,780,854	139,374	206,951	13,669	399,722	30,566	802,822	50,911	29,824	746,323
Western Ry. of Alabama	133	118,291	78,218	213,812	29,452	48,772	3,383	69,054	6,902	161,278	52,534	49,530	14,530
Wheeling & Lake Erie	511	1,141,701	56,829	1,324,427	187,266	275,570	8,715	498,105	26,447	998,898	64,000	261,529	-92,531
Wichita Falls & N. W.	329	214,892	37,756	263,583	78,611	23,279	2,036	141,992	47,974	252,665	10,918	9,098	17,263
Yazoo & Miss. Valley	1,381	1,724,218	479,518	2,315,003	378,250	538,556	15,609	804,222	67,974	1,781,061	533,943	468,296	-30,568

REVENUES AND EXPENSES OF RAILWAYS

TEN MONTHS OF CALENDAR YEAR 1919

TEN MONTHS OF CALENDAR YEAR 1919														
Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Equip-ment.	Traffic.	Trans- portation.	General.						Total.
141	\$1,505,868	\$628,814	\$2,287,577	\$428,027	\$495,706	\$18,854	\$919,009	\$87,895	\$1,969,022	86.07	\$112,372	\$205,899	-\$38,135	
312	5,964,971	2,071,568	8,489,661	2,138,029	1,278,746	132,342	3,289,130	185,317	7,076,233	83.35	232,786	1,179,529	-\$33,565	
301	2,812,771	595,554	3,601,410	515,570	619,743	47,147	1,060,599	106,560	2,951,755	81.96	163,103	489,388	379,150	
377	2,414,663	447,437	3,077,954	505,726	711,149	22,106	1,010,599	90,691	2,374,421	77.14	703,533	598,308	-\$58,408	
8,645	99,991,485	37,146,622	144,822,598	19,256,633	33,368,726	1,417,997	51,125,720	2,522,920	107,299,667	74.09	37,522,931	31,737,519	-\$5,785,412	
93	1,061,645	957,663	2,256,464	278,505	412,566	30,966	850,935	65,605	1,667,818	73.91	588,646	798,855	-\$395,630	
639	3,094,238	794,481	3,888,819	477,806	1,278,746	71,976	2,340,013	123,784	4,794,009	115.33	637,340	910,441	277,417	
177	1,191,574	253,814	3,065,675	477,806	1,278,746	17,044	1,883,834	13,762	2,866,146	73.36	1,040,531	5,542,313	4,023,402	
4,864	33,125,431	15,405,021	51,835,735	7,878,256	11,427,904	600,600	22,850,579	1,103,558	44,147,059	85.20	7,668,925	2,110,086	168,821	
90	1,132,523	305,2	1,638,242	345,506	454,878	11,406	262,901	80,284	2,206,626	133.07	276,092	825,203	168,821	
5,151	113,252,300	27,088,159	151,527,691	22,591,966	46,665,578	1,578,682	65,225,294	3,743,331	140,846,074	92.95	10,681,617	6,967,980	1,584,540	
87	838,144	452,629	1,360,332	155,055	395,102	10,371	780,714	34,829	1,376,071	101.15	5,839	49,993	292,714	
632	3,129,293	771,565	4,204,215	940,637	1,851,611	38,512	1,624,741	123,190	3,973,600	94.51	230,615	18,820	294,761	
118	796,233	254,271	1,103,001	284,492	408,180	218,924	465,024	50,816	997,436	90.42	105,365	212,800	77,023	
217	10,548,611	416,095	11,226,250	1,253,348	3,347,341	105,056	3,458,701	193,331	8,351,881	74.39	2,874,369	135,000	279,234	
37	951,589	20,442	1,010,966	384,210	59,363	12,068	236,227	32,748	377,048	113.27	134,169	78,193	126,701	
29	366,851	480,311	480,311	41,700	59,363	7,009	236,227	32,748	377,048	78.50	103,263	153,999	126,701	
228	35,256,120	18,412,521	59,675,322	7,881,886	11,636,462	413,668	31,337,781	1,725,297	53,466,825	89.39	6,428,992	1,807,795	287,256	
206	1,782,301	67,722	1,941,829	453,262	941,508	17,923	656,648	79,309	2,148,651	110.65	206,822	32,500	239,322	
589	10,321,063	1,310,265	12,110,845	1,969,972	4,318,305	145,459	5,712,855	326,674	12,995,972	103.17	385,137	270,000	655,660	
233	1,359,534	512,809	2,189,933	520,837	497,849	25,947	1,346,941	34,956	2,425,795	110.77	235,862	110,000	345,862	
282	4,484,884	342,718	4,914,209	763,705	1,207,163	45,657	1,520,697	136,611	3,702,671	75.34	1,211,538	163,000	1,048,364	
301	5,160,599	246,507	5,617,335	1,409,754	3,667,358	28,734	2,501,501	143,907	4,956,681	88.95	620,655	160,000	459,578	
1,918	10,716,108	5,320,719	17,690,513	3,492,366	6,329,961	347,059	7,589,966	593,665	15,698,436	88.74	1,992,077	635,337	1,348,727	
685	27,205,103	7,155,550	36,973,106	4,482,665	9,673,829	257,080	17,364,965	822,557	32,783,188	88.66	4,189,919	1,933,311	2,256,441	
411	3,506,422	900,977	4,807,738	947,678	1,228,448	76,116	2,430,525	177,965	5,888,007	111.61	560,668	174,000	386,668	
342	1,879,942	512,995	2,507,700	464,971	484,288	47,114	1,232,489	53,554	2,282,416	91.01	225,314	79,018	146,256	
2,503	44,572,095	12,343,923	60,445,935	9,825,591	13,931,528	361,377	23,493,698	1,114,823	49,047,015	81.13	11,398,294	1,660,441	9,732,763	
1,050	14,622,001	5,361,284	21,120,693	3,602,461	5,904,365	249,166	8,904,365	494,358	19,260,441	91.19	1,860,253	615,680	1,244,662	
1,131	15,375,691	4,068,208	20,942,491	3,169,177	7,365,605	215,981	8,731,333	477,372	20,327,542	95.63	914,948	749,092	161,992	
2,099	77,948,506	29,385,211	116,365,249	962,931	2,338,473	106,613	4,311,017	277,402	7,120,940	82.60	1,499,505	319,965	1,179,444	
8,090	77,198,246	29,385,211	116,365,249	962,931	2,338,473	106,613	4,311,017	277,402	7,120,940	82.60	1,499,505	319,965	1,179,444	
9,372	89,199,752	29,385,211	116,365,249	962,931	2,338,473	106,613	4,311,017	277,402	7,120,940	82.60	1,499,505	319,965	1,179,444	
1,496	12,110,332	5,054,004	18,354,866	3,029,961	4,060,071	262,413	7,877,332	453,220	15,724,120	85.66	2,630,745	508,263	2,061,881	
657	6,966,770	2,405,984	10,274,610	1,227,419	2,637,654	147,789	4,301,159	260,494	8,667,954	84.36	1,606,656	400,162	1,205,367	
12	88,474,950	23,316	1,453,415	383,014	658,434	78,462	1,738,858	902,185	3,291,449	115.48	473,131	26,589	499,893	
10,647	1,111,544	254,237	123,060,892	19,343,396	33,988,489	902,185	56,383,190	3,201,840	114,288,485	91.38	10,772,407	5,408,078	5,364,327	
474	2,904,287	895,866	4,042,612	644,486	724,650	20,242	1,738,858	902,185	3,291,449	115.48	473,131	26,589	499,893	
7,594	60,183,710	26,286,989	91,777,948	15,278,327	20,622,632	1,034,078	38,741,605	1,998,080	78,028,404	85.02	13,749,545	3,476,371	10,267,923	
1,749	14,904,607	6,287,631	22,682,130	3,295,814	4,773,778	188,778	12,133,879	501,082	26,891,685	88.72	3,690,445	1,082,932	2,607,513	
374	3,291,039	217,956	3,600,532	563,376	1,552,487	30,441	1,359,857	88,226	3,610,629	100.28	10,097	15,000	5,913	
76	723,369	79,931	951,778	177,682	218,790	53,073	1,343,681	132,492	2,850,156	100.85	8,113	53,730	78,254	
337	1,981,162	539,442	2,563,301	503,481	808,722	53,073	1,343,681	132,492	2,850,156	111.19	286,855	111,661	397,926	
331	9,592,094	3,051,671	13,295,145	1,914,970	4,318,465	228,837	5,380,354	343,447	12,257,191	92.19	1,037,964	378,667	654,800	
251	2,166,426	190,816	2,425,489	355,724	528,534	22,043	852,511	47,664	1,806,476	74.47	619,013	98,700	520,154	
2307	41,649,054	14,269,788	60,561,108	7,399,685	11,633,079	762,673	24,260,810	1,088,003	45,616,121	75.32	14,944,987	1,837,000	13,099,676	
1,601	8,533,820	2,117,679	10,880,447	1,070,036	1,617,666	84,723	3,992,497	349,191	8,854,255	81.37	2,026,164	470,000	1,552,436	
163	3,734,101	732,646	4,780,022	852,486	1,057,410	64,880	1,823,314	114,575	3,919,536	81.99	860,485	84,177	775,905	
875	24,660,778	7,272,738	29,049,930	3,673,052	8,177,647	200,407	12,774,646	1,079,611	26,209,610	90.22	2,840,320	627,000	2,206,114	
955	42,810,081	10,438,260	59,376,607	6,328,676	12,570,290	413,992	25,128,524	1,132,486	46,173,759	77.76	13,202,848	3,131,002	2,066,316	
2,594	19,616,097	5,791,602	27,020,630	4,173,128	6,504,352	196,063	9,095,759	693,053	21,092,658	78.06	5,297,972	1,090,000	4,833,440	
255	1,939,619	383,799	2,396,731	728,127	925,699	9,474	1,307,897	51,540	3,022,732	126.11	626,001	90,000	716,570	
381	9,777,517	326,607	1,380,353	230,712	368,918	28,614	633,291	95,073	1,355,927	98.23	24,426	78,797	54,372	
61	2,008,915	192,253	2											

REVENUES AND EXPENSES OF RAILWAYS

TEN MONTHS OF CALENDAR YEAR 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from operation.	Operating income (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total.	Way and structures.	Equipment.	Maintenance of way and structures.			
Et. Worth & Rio Grande.....	235	\$687,257	\$542,561	\$1,229,818	\$284,058	\$225,815	\$509,873	\$1,229,818	\$1,229,818	\$1,229,818
Galveston, Harrisburg & San Antonio.....	1,381	12,145,364	4,558,876	17,540,860	2,543,566	3,995,990	6,539,556	17,540,860	17,540,860	17,540,860
Georgia R. R.	13	726,766	286,385	1,013,151	81,498	24,200	105,698	1,013,151	1,013,151	1,013,151
Georgia Southern & Florida.....	348	3,321,811	1,497,050	5,177,735	534,582	868,978	1,403,560	5,177,735	5,177,735	5,177,735
Grand Rapids & Indiana.....	402	2,304,626	952,717	3,257,343	612,747	850,270	1,463,017	3,257,343	3,257,343	3,257,343
Grand Trunk Western.....	569	4,501,012	1,818,577	6,319,589	881,097	1,032,510	1,913,607	6,319,589	6,319,589	6,319,589
Great Northern.....	1,001	13,984,385	3,027,340	17,011,725	2,347,406	3,067,574	5,414,980	17,011,725	17,011,725	17,011,725
Great Northern & New England.....	1,172	2,008,743	393,290	2,402,033	974,842	1,427,191	2,402,033	2,402,033	2,402,033	2,402,033
Green Bay & Western.....	8,227	64,832,042	16,396,842	81,228,884	15,402,551	15,858,095	31,260,646	81,228,884	81,228,884	81,228,884
Gulf & Ship Island.....	252	779,382	165,679	945,061	219,826	252,939	472,765	945,061	945,061	945,061
Gulf, Colorado & Santa Fe.....	307	1,411,130	458,766	1,869,896	529,845	487,264	1,017,109	1,869,896	1,869,896	1,869,896
Hocking Valley.....	1,935	11,786,179	4,505,069	16,291,248	3,759,290	3,103,573	6,862,863	16,291,248	16,291,248	16,291,248
Houston & Texas Central.....	350	8,363,060	1,018,551	9,381,611	1,118,725	3,162,313	4,266,588	9,381,611	9,381,611	9,381,611
Illinois Central.....	847	5,011,747	2,130,906	7,142,653	1,428,251	1,439,044	2,867,295	7,142,653	7,142,653	7,142,653
Indiana Harbor Belt.....	990	1,397,217	456,861	1,854,078	253,879	243,513	497,392	1,854,078	1,854,078	1,854,078
International & Great Northern.....	4,791	63,381,263	20,057,570	83,438,833	15,436,938	1,060,066	16,500,004	83,438,833	83,438,833	83,438,833
Kanawha & Mich.....	1,159	8,218,189	2,777,582	11,020,771	5,447,281	3,163,099	8,610,380	11,020,771	11,020,771	11,020,771
Kansas City, Mexico & Orient.....	176	3,005,056	558,872	3,563,928	540,647	1,348,146	1,888,793	3,563,928	3,563,928	3,563,928
Kansas City, Mexico & Orient of Texas.....	272	908,636	176,752	1,085,388	1,137,714	446,841	1,584,555	1,085,388	1,085,388	1,085,388
Kansas City Southern.....	465	758,122	160,157	918,279	336,675	426,917	763,592	918,279	918,279	918,279
Kansas City Terminal.....	774	9,394,799	2,018,344	11,413,143	1,960,757	2,739,969	4,700,726	11,413,143	11,413,143	11,413,143
Lake Erie & Western.....	26	7,072,259	663,111	7,735,370	1,156,457	251,287	1,407,744	7,735,370	7,735,370	7,735,370
Lake Superior & Ishpeming.....	902	7,072,259	663,111	7,735,370	1,156,457	251,287	1,407,744	7,735,370	7,735,370	7,735,370
Lehigh & Hudson.....	34	816,891	2,263	819,154	920,785	193,012	1,113,797	819,154	819,154	819,154
Lehigh & North Western.....	96	2,141,204	40,611	2,181,815	2,256,903	268,002	2,524,905	2,181,815	2,181,815	2,181,815
Lehigh Valley.....	231	3,051,899	15,892	3,067,791	3,219,201	482,845	3,702,046	3,067,791	3,067,791	3,067,791
Long Island.....	1,435	43,010,643	5,764,879	48,775,522	8,095,607	8,095,607	16,191,214	48,775,522	48,775,522	48,775,522
Los Angeles & Salt Lake.....	398	5,159,991	13,728,472	18,888,463	2,605,740	3,478,513	6,084,253	18,888,463	18,888,463	18,888,463
Louisiana & Arkansas.....	1,168	9,712,544	2,000,282	11,712,826	2,040,873	1,831,327	3,872,200	11,712,826	11,712,826	11,712,826
Louisiana R. & Navigation Co.....	302	1,257,823	390,448	1,648,271	1,712,103	527,414	2,239,517	1,648,271	1,648,271	1,648,271
Louisiana Western.....	349	2,394,689	368,633	2,763,322	3,911,687	812,921	4,724,608	2,763,322	2,763,322	2,763,322
Louisville & Nashville.....	207	2,137,787	1,107,021	3,244,808	3,396,486	495,940	3,892,426	3,244,808	3,244,808	3,244,808
Louisville, Henderson & St. L.....	5013	63,648,954	20,746,181	84,395,135	13,818,801	23,214,552	37,033,353	84,395,135	84,395,135	84,395,135
Maine Central.....	199	1,684,826	651,571	2,336,397	493,993	330,955	824,948	2,336,397	2,336,397	2,336,397
Michigan, Delaware & Virginia.....	1,216	9,245,809	4,155,448	13,401,257	2,658,267	3,395,190	6,053,457	13,401,257	13,401,257	13,401,257
Midland Valley.....	82	704,287	414,250	1,118,537	91,272	127,156	218,428	1,118,537	1,118,537	1,118,537
Mineral Range.....	1,861	42,575,845	16,579,083	59,154,928	8,173,796	12,753,062	19,926,858	59,154,928	59,154,928	59,154,928
Minneapolis & St. Louis.....	388	2,323,717	826,077	3,149,794	734,409	607,521	1,341,930	3,149,794	3,149,794	3,149,794
Minn., St. Paul & Sault Ste. Marie.....	101	606,911	3,716	610,627	637,002	212,417	849,419	610,627	610,627	610,627
Minn., St. Paul & Sault Ste. Marie.....	1,646	8,334,844	2,301,303	10,636,147	1,972,748	2,691,315	4,664,063	10,636,147	10,636,147	10,636,147
Minn., St. Paul & Sault Ste. Marie.....	4,243	26,039,162	6,833,131	32,872,293	5,313,637	7,178,341	12,491,978	32,872,293	32,872,293	32,872,293
Mississippi Central.....	194	519,292	251,937	771,229	221,405	165,170	386,575	771,229	771,229	771,229
Missouri & North Arkansas.....	164	520,707	281,335	802,042	212,210	302,933	515,143	802,042	802,042	802,042
Missouri, Kansas & Texas.....	365	806,196	422,914	1,229,110	599,586	378,959	978,545	1,229,110	1,229,110	1,229,110
Missouri, Kansas & Texas of Texas.....	1,713	20,060,842	6,705,093	26,765,935	5,041,412	7,937,080	12,982,492	26,765,935	26,765,935	26,765,935
Missouri, Oklahoma & Gulf.....	1,796	12,523,045	6,711,290	19,234,335	4,336,489	3,857,200	8,193,688	19,234,335	19,234,335	19,234,335
Missouri Pacific.....	332	976,632	185,789	1,162,421	579,160	308,444	887,604	1,162,421	1,162,421	1,162,421
Monongahela Rv.....	7,185	54,625,864	17,142,520	71,768,384	15,355,502	17,167,852	32,523,354	71,768,384	71,768,384	71,768,384
Monongahela Connecting.....	996	10,183,728	1,834,964	12,018,692	2,241,242	3,711,912	5,953,154	12,018,692	12,018,692	12,018,692
Montour.....	108	2,152,120	207,742	2,359,862	2,980,846	592,478	3,573,324	2,359,862	2,359,862	2,359,862
Morgan's Louisiana & Texas R. R.....	56	1,070,805	13,844	1,084,649	1,133,514	610,504	1,744,018	1,084,649	1,084,649	1,084,649
Nashville, Chattanooga & St. L.....	400	4,232,584	1,729,910	5,962,494	1,326,590	390,506	1,717,096	5,962,494	5,962,494	5,962,494
Nevada Northern.....	1,247	10,755,756	4,489,965	15,245,721	4,180,449	2,240,449	6,420,898	15,245,721	15,245,721	15,245,721
New Orleans & N. E.....	168	1,404,333	1,264,313	2,668,646	218,546	224,049	442,595	2,668,646	2,668,646	2,668,646
New Orleans Great Northern.....	195	1,367,281	1,526,129	2,893,410	963,390	1,164,887	2,128,277	2,893,410	2,893,410	2,893,410
New Orleans, Texas & Mexico.....	284	3,303,281	451,205	3,754,486	381,638	423,144	805,782	3,754,486	3,754,486	3,754,486
New York Central.....	191	1,198,399	377,112	1,575,511	1,660,898	408,052	2,068,950	1,575,511	1,575,511	1,575,511
New York, Chicago & St. L.....	6,075	156,839,316	71,416,147	228,255,463	32,940,826	55,704,102	88,644,928	228,255,463	228,255,463	228,255,463
New York, New Haven & Hartford.....	574	17,450,262	1,645,388	19,095,650	2,458,863	3,625,431	6,084,294	19,095,650	19,095,650	19,095,650
New York, Ontario & Western.....	1,965	40,007,751	37,185,611	77,193,362	11,645,006	17,550,259	29,195,265	77,193,362	77,193,362	77,193,362
New York, Philadelphia & Norfolk.....	569	5,367,038	2,463,011	7,830,049	1,439,544	2,202,166	3,679,700	7,830,049	7,830,049	7,830,049
New York, Susquehanna & Western.....	121	5,194,429	1,174,423	6,368,852	554,192	1,722,721	2,277,013	6,368,852	6,368,852	6,368,852
Newburgh & South Shore.....	135	2,254,187	578,055	2,832,242	3,230,886	371,210	3,602,096	2,832,242	2,832,242	2,832,242
Norfolk & Western.....	7	1,067,250	185,407	1,252,657	1,067,250	185,407	1,252,657	1,252,657	1,252,657	1,252,657
Norfolk & Southern.....	2,088	51,432,344	9,234,089	60,666,433	63,482,642	8,490,149	71,972,791	60,666,433	60,666,433	60,666,433
Norfolk & Southern.....	2,088	5,481,090	1,542,487	7,023,577	1,113,991	1,018,908	2,132,899	7,023,577	7,023,577	7,023,577

REVENUES AND EXPENSES OF RAILWAYS

TEN MONTHS OF CALENDAR YEAR 1919—CONTINUED

TEN MONTHS OF CALENDAR YEAR 1919.—CONTINUED															
Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from railway operation.	Operating ratio.	Operating income (or loss).	Increase (or decr.) income comp. with last year.				
		Freight.	Passenger.	Total.	Way and structures.	Equip-ment.	Traffic.					Trans- portation.			
Northern Pacific	6,584	\$60,200,635	\$17,059,808	\$83,246,512	\$14,093,357	\$14,313,467	\$604,409	\$31,079,279	\$1,856,271	\$62,784,658	75.42	\$20,461,855	\$6,253,877	\$14,190,529	—\$4,613,243
Northern Pacific	5,288	2,880,793	2,039,263	5,463,239	1,031,779	702,693	50,910	2,314,184	129,461	4,247,230	77.74	1,216,009	234,230	980,356	—468,665
Northern Pacific	112	797,870	134,581	932,451	56,799	56,799	13,459	582,697	17,853	887,752	92.39	582,697	34,700	38,335	—292,817
Northern Alabama	2,347	23,766,964	5,907,058	31,619,028	4,860,210	5,235,060	165,215	9,223,556	930,202	21,003,409	66.42	10,615,620	1,653,587	8,959,789	80,881
Oregon Short Line	2,070	16,166,775	5,654,629	23,604,722	4,152,769	3,598,254	284,139	9,293,511	943,360	18,521,568	78.46	5,083,154	1,137,971	3,941,931	—416,990
Panhandle & Santa Fe	772	3,859,584	1,028,598	5,121,281	939,920	1,704,314	39,829	2,302,866	147,021	5,121,651	100.00	—370	179,745	—181,303	—607,364
Penn. R. R.	1,754	64,456,785	17,527,285	81,984,070	12,783,641	23,864,768	749,790	37,532,122	1,899,055	77,488,815	86.87	11,701,781	3,132,595	8,565,002	3,722,672
Penn. R. R., East.	5,367	204,263,356	87,830,631	318,884,368	45,704,815	90,533,012	2,605,126	138,387,277	7,339,706	290,312,625	91.04	28,517,744	9,003,577	19,514,167	3,410,611
Peoria & P. U.	19	218,770	37,215	255,985	1,018,199	181,081	7,772	751,321	53,552	1,399,476	137.44	—381,276	95,000	—476,276	—260,960
Pere Marquette	2,232	21,635,860	5,086,943	28,966,321	2,949,951	5,634,815	282,896	11,766,194	725,474	21,479,296	74.15	7,487,025	548,641	6,936,087	3,348,121
Perkiomen	41	797,750	82,926	913,021	59,524	43,238	208	361,905	3,261	468,344	51.29	444,677	17,627	427,050	48,209
Phila. & Reading	1,127	48,655,567	8,999,014	61,042,066	6,500,755	15,754,073	374,836	29,222,080	1,352,049	53,380,395	87.44	7,661,671	1,432,281	6,229,172	—5,154,592
Phila., Bethlehem & New England	71	1,039,236	1,039,236	2,078,472	80,476	123,278	1,322	449,981	10,752	668,009	97.31	18,427	12,743	5,684	—164,066
Pitts., Bethlehem & Lake Erie	224	19,593,756	2,191,909	23,594,510	3,767,029	7,070,546	148,708	8,346,142	440,353	19,784,357	83.85	3,810,152	744,500	3,065,417	—5,510,255
Pitts. & W. Va.	63	921,124	97,167	1,145,167	509,925	427,034	12,587	542,394	57,512	1,628,038	142.16	—482,872	116,430	—599,432	—447,977
Pitts. & Shawmut	103	939,364	41,723	994,737	324,386	393,549	15,578	362,420	30,293	1,126,226	113.21	—131,489	9,752	—141,241	—160,844
Pitts., Cinc., Chicago & St. Louis	2,383	52,294,128	18,464,780	77,920,045	10,735,032	24,077,541	885,612	34,339,229	1,777,772	72,559,526	93.09	5,380,520	2,413,213	2,964,130	—2,850,950
Pitts., Shawmut & Northern	205	881,945	59,887	973,211	249,693	491,182	9,752	1,260,434	71,656	1,231,713	125.68	249,962	18,533	268,513	137,519
Port Reading	21	1,322,642	2,097,423	3,419,065	198,929	154,792	168	1,003,853	11,082	1,368,818	65.26	728,605	99,229	629,375	61,499
Quincy & Omaha & Kansas City	255	596,823	258,180	854,903	352,255	171,774	2,208	477,168	13,771	1,014,423	110.74	—98,430	30,437	—128,937	41,699
Rich., Fred. & Pot.	81	3,117,658	2,861,335	6,399,624	522,358	893,863	42,614	2,153,791	132,386	3,842,822	58.76	2,696,804	127,364	2,569,359	126,690
Rutland	415	2,129,336	1,146,900	3,974,859	683,075	969,644	64,710	1,856,162	114,809	3,696,800	93.00	278,059	192,257	85,788	—543
St. Joseph & G. I.	258	1,892,741	2,451,136	4,343,877	80,476	123,278	1,322	449,981	10,752	668,009	97.31	18,427	12,743	5,684	—164,066
St. L., Brownsville & Mex.	548	2,898,626	1,352,931	4,251,557	858,855	738,021	54,120	1,260,969	120,461	2,332,643	95.16	118,492	100,285	18,207	197,163
St. L., Merchants Bridge Term.	9	.....	6,280	6,280	538,747	429,918	7,445	1,859,323	61,421	2,876,853	112.64	—322,797	80,000	—402,806	503,669
St. L., San Francisco	4,761	42,509,736	18,561,759	64,353,484	10,217,353	12,625,707	538,057	24,257,182	1,756,376	49,239,155	76.50	15,124,329	2,257,208	12,845,482	2,993,310
St. L. Transfer	6	1,001,368	181,015	1,255,180	119,045	119,045	1,847	47,283	21,837	687,400	74.29	237,780	1,172	236,607	92,710
St. L., San Francisco & Texas	134	1,892,741	2,451,136	4,343,877	80,476	123,278	1,322	449,981	10,752	668,009	97.31	18,427	12,743	5,684	—164,066
St. L., Southwestern	939	8,593,307	1,817,679	10,776,727	1,822,227	2,376,979	165,112	3,318,328	39,091	11,911,000	94.13	74,253	15,527	58,726	—809,017
St. L., Southwestern of Texas	814	3,831,182	1,280,717	5,457,185	1,444,515	1,835,291	84,511	2,808,342	228,182	6,383,594					

Dissolution of the "Packers' Trust"

The government's anti-trust action against the five large meat packing companies, Swift, Armour, Morris, Wilson and Cudahy, has been compromised under an agreement by which the packers will confine themselves hereafter to the meat and provision business. An injunction decree to which the packers have acceded will be entered in the federal courts and under its terms the companies have agreed to sell, under supervision of the United States District Court, all their holdings in public stock yards, all their interests in stock yard railroads and terminals, all interest in public warehouses, except as necessary for their own meat products, to abandon the use of the branch houses, route cars and auto trucks (comprising their distribution system) for any other than their own meat and dairy products, and to dissociate themselves from the retail meat business and "unrelated lines" of business.

Organized Labor Adopts a "Declaration of Rights"

The conference of officers of national and international unions affiliated with the American Federation of Labor and of the four railway brotherhoods of train service employees, held at Washington beginning on December 13, adopted a declaration of rights which asserted that "the right to cease work—strike—as a final means of enforcing justice from an autocratic control of industry must be maintained." The anti-strike provision of the Cummins bill and all similar proposed legislation were specifically denounced as "un-American, vicious in character and as establishing by legislation involuntary servitude." It was urged that the judges of federal courts shall be elected by the people for terms not exceeding six years. Regarding the railroads, the declaration includes the following:

"Since the government has not worked out a constructive railroad policy, we urge for and on behalf of the railway workers and of the general public, that the railroads be retained under government administration for at least two years after January 1, 1920, in order that a thorough test may be made of governmental operation under normal conditions.

"The common carriers of this country are the arteries of travel, commerce and industry. Transportation service and rates are intimately bound up with industrial production in all parts of the country."

Board Named to Consider

Miners' Wages and Coal Prices

Members of the commission to carry out the government's plan for the settlement of the coal strike controversy were appointed by President Wilson on December 21 as follows: Henry M. Robinson, of Pasadena, Cal., as the representative of the public; John P. White, representing the miners, and Rembrandt Peale, representing the coal operators. In his letter asking them to serve on the commission the President said that if in their judgment a readjustment of the price of coal shall be necessary to meet any increase of wages beyond the 14 per cent put into effect to induce the striking miners to return to work he would clothe the commission with the powers vested in the Fuel Administration for that purpose, but only in the event of a unanimous decision by the commission.

The Bituminous Coal Operators' Association issued a statement denying an assertion made by the President that the operators had generally agreed to the terms of the settlement offered to the miners' union on December 6. The statement asserted that the operators had not been consulted and had not seen the memorandum of agreement. To this Attorney General Palmer replied that failure of the operators to agree now to the government's plan would be "an amazing repudiation of their own statements." The operators say they had agreed to the plan previously proposed by Dr. Garfield for a 14 per cent increase in wages with no increase in coal prices and that the attorney general had later compromised with the miners, while Mr. Palmer has taken the position that the government had forced a settlement.

Traffic News

The Governor of Kansas on December 14 sent urgent messages to Walker D. Hines, director general, and Hale Holden, regional director of the Central Western region, asking them immediately to investigate the car shortage situation which is causing enormous loss to farmers. The messages stated that 49 per cent of the wheat crop in the northwestern quarter of Kansas still is in the hands of the farmer, some of it on the ground. All elevators are said to be full and no cars available to move the wheat to markets.

According to a report on overseas traffic for the week ended December 10, 1919, made to Walker D. Hines, director general of railroads, 6,749 cars of commercial export freight were received at North Atlantic ports for this period, as compared with 1,041 cars for the same week of 1918. This shows an increase of 5,708 cars or 548 per cent, for December 10, 1919, as against the corresponding period last year. For the same period deliveries to ships increased 6,004 cars or 512 per cent. At South Atlantic and Gulf ports as of December 7, 1919, there were 13,228 cars of export freight on hand, as against 12,498 cars on December 1, an increase of 730 cars. On December 10, 1919, there were 11,978,708 bushels of grain stored in elevators at North Atlantic ports. There were received during the week 3,757,888 bushels, while 4,661,885 bushels were cleared. The total amount of grain in elevators at these ports on the date mentioned represents 60.7 per cent of the total elevator capacity, compared with 65.4 per cent for the week previous. At South Atlantic and Gulf ports there were stored in elevators on December 10, 1919, 8,416,109 bushels of grain, representing 82.6 per cent of the total elevator capacity.

Coal Restrictions Relaxed

Because of the increased production of coal incident to the return of a large proportion of the striking miners to work on December 15, the Railroad Administration has relaxed most of the restrictions on the distribution of coal and has allowed shipments to run practically as billed except as it has been necessary to divert shipments occasionally to meet emergency situations. Some local embargoes were necessary in the middle west for a time.

Seven Hundred Automobile Stock-cars

According to a circular issued by the National Automobile Chamber of Commerce, 700 loaded motor trucks have entered the stock yards at Indianapolis, Ind., in a single day, some of them having come from points 80 miles away. On one day recently the number of hogs delivered at these stock yards by motor trucks was 6,800, valued at \$200,000. These animals were brought by about 500 vehicles and the total number of hogs was 2,000 more than the number received on the same day by steam and interurban railroads. It was estimated that the 500 trucks had traveled 2,500 miles and had consumed 300 gallons of gasoline. In the year 1918 the number of hogs received at Indianapolis by motor trucks was 462,313, more than 50 per cent greater than in 1917.

Receipts of hogs by motor truck at Sioux City, Iowa, are reaching enormous proportions. The number received at this point during January, February and March, 1917, totalled 9,655; for a similar period in 1918, this had increased to 13,750, while for a similar period in 1919, the amount had jumped to 26,195. It is expected that the figures for this year will be more than 90,000.

The vice-president of the St. Joseph (Mo.), stockyards reports the following receipts by motor truck:

Year	Cattle	Hogs	Sheep
1918	20,686	121,138	37,137
1917	15,043	56,529	31,094

This livestock is coming in from a radius of 50 miles. It is declared to be in better condition than ever before.

Commission and Court News

Personnel of Commissions

The Senate has confirmed the President's reappointment of Edgar E. Clark as a member of the Interstate Commerce Commission for a term expiring December 31, 1926.

Court News

Condemnation of Land for Connecting Track

The Illinois Supreme Court holds that a contract for joint use by the railroads and the consent and approval of the Public Utilities Commission are not conditions precedent to a railroad's right to condemn property for a connecting track.—*Chicago, M. & St. P. v. Frauzen* (Ill.), 122 N. E., 492.

Contributory Negligence of Volunteer

In an action by an infant for bodily injuries received on its acceptance of an invitation of an employee of the defendant railroad to couple engines, the Texas Court of Civil Appeals holds that in order to recover it must be shown that the infant was not capable of appreciating the danger.—*Trinity Valley & Northern v. Scholz* (Tex.), 209 S. W., 224.

Care of Passenger in Aisle of Car

The Texas Court of Civil Appeals holds that the conductor of a passenger train was not negligent in standing in the aisle about the middle of a car, bent over talking to someone as a woman approached, walking to the rear, and became overbalanced while attempting to stop to wait until the conductor would let her pass.—*Gulf, Colorado & Santa Fé* (Tex.), 209 S. W., 772.

Assisting Alighting Passengers

Whether or not a person comes within the excepted class of passengers who require assistance to alight as being sick or infirm is a question for the jury, the standard of the carriers' duty not being fixed but variable and shifting with circumstances; but the Oklahoma Supreme Court holds that where there is no evidence to bring the plaintiff within the exception, it is reversible error to submit the question to the jury on a purely hypothetical case.—*Dickinson v. Tucker* (Okla.), 176 Pac., 949.

Stop, Look, Listen Rule—Pennsylvania

The Pennsylvania Supreme Court holds that in an action for injury at a crossing, the railroad's point for a charge that it is a positive duty of an automobile driver approaching a grade crossing where there is restricted vision to stop, look and listen at a place where that will be effective, and that failure to do so is negligence per se, and that, if unable to get a sufficient view from his car, he should get out and go to a place affording a sufficient view, should have been unqualifiedly affirmed.—*Knepp v. Baltimore & Ohio* (Pa.), 105 Atl., 636.

Indorsement of "Order" Bill of Lading

The Georgia Court of Appeals holds that where an "order notify" bill of lading contains a provision requiring the surrender of the original bill of lading, properly indorsed, the fact that the shipper, by mistake, sends the original bill of lading (instead of the memorandum bill of lading) direct to the party to be modified, but sends it unindorsed, does not relieve the carrier from requiring it to be properly indorsed before delivering the shipment; and where, under such circumstances, the carrier so delivers the property, without requiring such indorsement, and the party to whom delivered obtains the shipment and subsequently becomes insolvent, without having paid the purchase price of the property, the principle of law that, where one of two innocent persons must suffer for the act of a third person, he who puts it in the power of the third person to in-

flict the injury must bear the loss, does not apply. The antecedent error of the shipper in sending the original bill of lading to the wrong party did not put it in the power of that party to inflict the injury, as its possession of the unindorsed bill of lading did not vest it with any apparent right to the property. The loss resulted from the negligence of the carrier in failing to require the proper indorsement of the bill of lading.—*Southern R. v. Massee, etc., Lumber Co.* (Ga.), 98 S. E., 106.

Sale of Freight to Pay Demurrage

The South Carolina Supreme Court holds that a shipper was not entitled to recover the value of lumber sold by the terminal carrier to pay freight and demurrage charges, where the new consignee to whom the plaintiff shipper directed the initial carrier to divert shipments defaulted in giving instructions, and where the instructions finally received gave notice that no demurrage charges would be paid after a certain day.—*Thomas v. Northwestern of South Carolina* (S. Car.) 98 S. E. 336.

What a Right of Way Condemnation Award Includes

The Virginia Court of Appeals affirms the rule that the conveyance to a railroad of a right of way vests in the company the same rights as though the land had been acquired by condemnation, and the grantor cannot recover for any damages to the remainder of his land resulting from a proper construction, use, and operation of the property conveyed; and where part of a tract of land is taken by condemnation proceedings for a right of way, the award includes damages to the residue of the tract which are due to the construction and operation of the railroad on a grade different from the natural surface of the land.—*Pamplin v. Norfolk & Western* (Va.), 98 S. E., 51.

Warning Signals on Bridge Under Repair

The Alabama Supreme Court holds that a pedestrian who saw barriers and red lights intended to warn against the use of a bridge maintained by a railroad under authority of a city and which was being repaired, was conclusively charged with knowledge that the barriers and lights were placed to warn him not to attempt to cross. Although they were insufficient, a pedestrian, who saw both, and attempted to cross without looking for holes and defects, could not recover for injuries sustained. The mere fact that he saw others using the bridge did not justify him in disregarding the signals and red lights, and when he did he assumed the risk.—*Morgan v. Mobile & Ohio* (Ala.) 80 So. 845.

Promise to Pay Claim Not Binding Without Consideration

The Texas Court of Civil Appeals holds that a mere promise by a railroad to pay for goods lost, for which it was not liable, and which was not in the nature of a compromise, is not binding on the railroad, because it was without consideration. This rule was applied where the shipper presented a claim to the receiver of the M., K. & T., which stamped it "vouchered," meaning that the claim had been passed upon, approved, and ordered paid by the receiver, acting through the claim department. It was held that if the M., K. & T. was not liable on the claim, its promise to pay was without consideration and not binding on it.—*Mistrort-Calahan Co. v. M., K. & T.* (Tex.), 209 S. W., 775.

Interstate Shipment—Innocent Purchaser of

Bill of Lading

The Texas Court of Civil Appeals holds that a car of grain carried from St. Joseph, Mo., to Temple, Tex., was an "interstate shipment" as between carrier and shipper, though the bill of lading indicated it was intrastate; but the carrier was held estopped from asserting the interstate character of the shipment as against the purchaser, who paid the draft drawn on him to which the bill of lading was attached, without knowledge that the grain was originally shipped from another state.—*Missouri, K. & T. v. Clement Grain Co.* (Tex.) 211 S. W. 347.

Railroad's Title to Lands Acquired

Under the Texas statutes, a railroad may condemn property, not only for right of way, but for other necessary uses. But it also has the right to acquire real estate without limitation or restriction in use; and, when so acquired, its title is as absolute as that of a private individual, at least insofar as concerns immunity from attack by anyone but the state. It may, of course, often be a question whether or not the deeds when properly construed convey a fee upon condition or limitation, or merely an easement in the property. The Texas Commission of Appeals holds that deeds by trustees to a railroad on condition that the premises shall be used exclusively for railroad purposes, and that after they shall cease to be used for such purposes they shall revert to the grantors or their "successors," naming a small consideration, the real consideration being expected enhancement in value of the grantors' adjoining property, conveyed a fee upon condition subsequent, and not upon limitation, and the railroad took an indefeasible title after the grantors' sale of the adjoining land.—*Stevens v. Galveston H. & S. A. (Tex.)* 212 S. W. 639.

Decisions Under Federal Employers' Liability Act

The New Hampshire Supreme Court holds that a locomotive engineer, acting under two orders, one to help an interstate freight train to a summit and the other to return with his engine, was within the federal act when injured on his return trip.—*Callahan v. Boston & Maine (N. H.)* 106 Atl. 37.

The New Jersey Court of Errors and Appeals holds that a workman of an independent stevedoring corporation contracting with a railroad at a stipulated charge per ton to load and unload freight at a water front terminal and which selects, pays and directs its men, is not an employee of the railroad while engaged in such work, within the meaning of the act, and is not entitled to the benefits of the act in an action against the railroad.—*Drago v. Central of New Jersey (N. J.)* 106 Atl. 803.

The Pennsylvania Supreme Court holds that where a local train operating entirely within the state, while switching an empty freight car from one track to another in a private yard, attached it to the rear end of a train, the mere fact that several cars in the train were consigned from points without the state to the owner of the yard was not sufficient to sustain a finding that a brakeman injured by an alleged defective brake, while riding on the empty car, was engaged in interstate commerce as distinguished from a mere local switching operation.—*Murray v. Pittsburgh C. C. & St. L. (Pa.)* 107 Atl. 21.

The Illinois Supreme Court holds that a locomotive boiler washer shot and killed by another employee of the railroad while engaged in washing a boiler on a locomotive, not assigned to any particular train or work, but standing in the yard ready to be assigned to either intrastate or interstate commerce, is not engaged in interstate commerce.—*Rock Island v. Industrial Commission (Ill.)* 123 N. E. 278.

The North Dakota Supreme Court holds that an employee of an interstate railroad who is injured while removing snow from a track over which interstate trains are being run regularly, is engaged in interstate commerce within the act.—*Koofors v. Great Northern (N. Dak.)* 170 N. W. 859.

The Iowa Supreme Court holds that a freight conductor employed on a line entirely within the state, who fell from the platform of the caboose and was killed while taking the caboose and motor to the barn, subsequent to reporting at the yard office after having uncoupled from a train containing one car consigned to a point in another state, was not engaged in interstate commerce.—*Smith v. Interurban (Iowa)* 171 N. W. 134.

The New York Appellate Division holds that the watchman of a lot of freight placed upon a pier after its interstate shipment, who was killed while so employed before the consignee had taken possession or paid freight charges and before the expiration of the 48-hour period allowed in which to remove the goods, is not entitled to an award under the state Workmen's Compensation Act, having been killed while guarding an interstate shipment.—*O'Brien v. Pennsylvania*, 176 N. Y. Supp. 390.

Foreign Railway News

The railway delegates of all the states of the Australian Commonwealth have passed, says *Modern Transport*, a resolution demanding a share in the management of the railways.

South African Railway Rates Increased

Increases in railway rates have recently been made effective in South Africa as follows: Passenger fares, 10 per cent.; luggage, parcels and live stock 25 per cent., goods 25 per cent., except coal for export and coal for local consumption conveyed less than 500 miles.

Road Transport Cheaper Than Rail Transport?

Francis White, borough engineer and surveyor of Blackpool, stated in a paper before the Road Transport Congress recently that motor car-a-bancs could be run at a substantial profit at a two cents per mile per passenger as compared with three cents per mile on railways.

Railway Station Roof Air Signs

Airplane travel in England has now reached such an importance as to bring out the recent notice to airmen by the Air Ministry: "The roofs of the following railway stations are now marked with the name of the place in large white letters: Redhill, Tonbridge and Ashford (South Eastern and Chatham Railway), and Hitchin (Great Northern Railway)."

22,600 New Wagons for English Railways

In reply to a question asked in the House of Parliament, Sir Rhys Williams, Parliamentary Secretary to the Ministry of Transport, stated that from the beginning of the year to the end of September 8,480 railway wagons had been constructed in the United Kingdom. Orders for the construction of 22,600 wagons had been placed with the railway companies, including contracts with outside firms for 5,400. No wagons have been ordered by the Ministry of Transport.

Cost of Government Locomotives

Three hundred and five Great Central railway type, ten New South Wales Government type and fourteen tank engine Dutch railway type superheated locomotives were built in Great Britain and sent to France. The average cost of these locomotives varied between £5,500 and £8,300. The tank engine Dutch railway type locomotives were sold for 200,000 francs each (approximately £8,000). The others are being allocated to the British railway companies under a pooling arrangement under the direction of the Ministry of Transport; 154 having already been allocated. About one hundred of the locomotives built for government use have been sold. The bulk of these engines have been sold to the Great Western and Great Eastern railways, while a few have been disposed of to the South Eastern & Chatham.

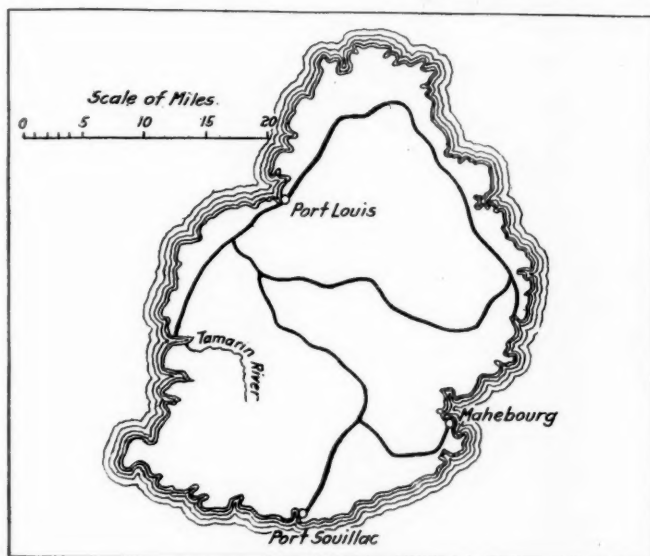
A Bill to Prevent "Lightning Strikes"

The Liberty and Property Defence League of England has prepared for immediate presentation to Parliament a bill under the title of the Trade Disputes Bill, with the double object of securing an interval for reflection before a trade dispute is allowed to develop into a strike or lockout, and of vesting in the members of a union (as distinct from the executive) the right to say whether the authority and funds of the union shall be employed for the purpose of a strike or lockout. It is proposed to provide that a strike or lockout, whether or not a union is concerned, shall not take place until 14 days after a statement relative to the dispute has been published by the Minister of Labor, and that a union shall not be concerned in a strike or lockout until it has obtained the approval of the members. It is not intended to interfere with the right of members of the union

to strike or not to strike, whatever the result of the ballot, but if the ballot went against the strike they could not receive strike pay from the union.

Electrification of Mauritius Railways

Major G. McAlpine, who was electrical adviser to the Government of Mauritius, drafted a report in 1904 recommending the electrification of all the Mauritius railways. This island in the Indian Ocean has about 120 miles of standard gauge railway. Major McAlpine showed in his report that power could be obtained by utilizing the waterfalls, which are numerous on the island. The plan met with favor in the legislative council, and now that the island's finances are in a prosperous condition, the matter has been brought forward for re-examination. A committee has been appointed to go into the whole question over again, but owing to the popular feeling in favor of the change



The Railways of Mauritius

its recommendation is a foregone conclusion. It has been computed that one of the waterfalls—that of Tamarin—will alone suffice to provide the power required to supply the whole of the island with electricity as well as to work the railways electrically. Eleven of the 132 villages and towns of the colony are already lighted by electricity, and authority has just been given by the legislative council to extend the services to seven other towns. Difficulty is, however, being experienced by the two local electric undertakings as well as by the municipality of Port Louis, in getting supplies of wire lamps and meters from England. Inquiries have been made in the United States by one

newly-established firm in Port Louis to meet the demand, but the response so far, it is reported, has not been favorable.

New Fuel for French Locomotives

The Paris, Lyons & Mediterranean has decided to adapt 200 of its locomotives to crude oil or Mazout. The modification is expected to be effected at the rate of two engines a day. Reserve tanks will be set up at suitable points on the system to hold between 40 and 100 tons of fuel.

The plant modifications are neither difficult nor costly, being simply a reservoir in place of the coal bunkers, conducting tubes to the burners and refractory bricks in the firebox.

At an official test held at Bercy on November 25, the locomotive drew a heavy goods train upon approximately half the weight of fuel which would have been necessary for the work if coal had been used. There is practically no smoke and it is expected that this fuel will save much labor in the engine houses.

The International Commission of the Rhine

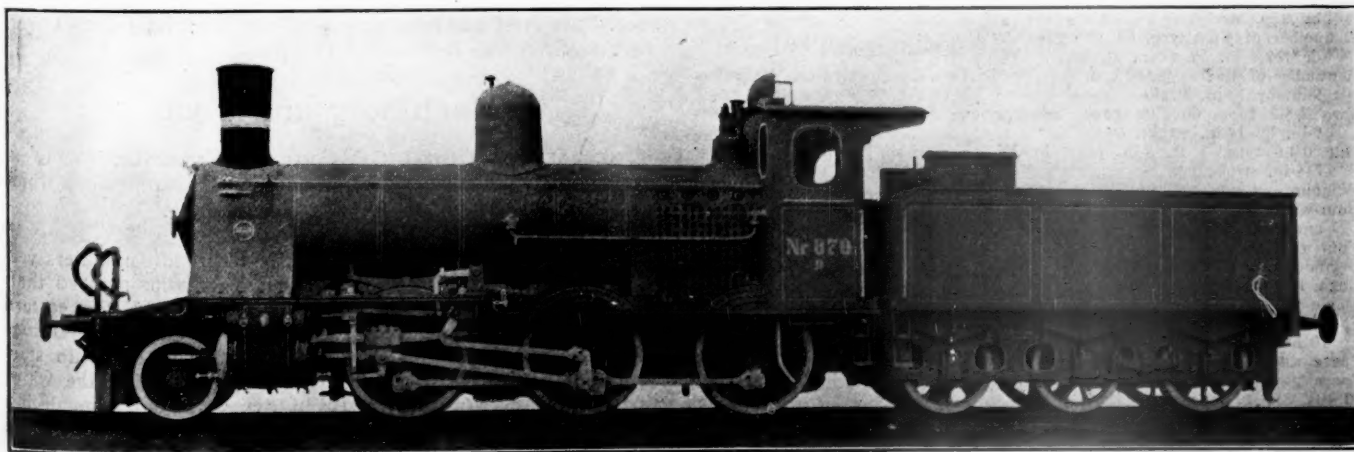
It appears, said *La Presse de Paris*, in its issue of November 21, that when the Treaty of Versailles goes into effect, M. Claveille, Minister of Public Works, will be appointed president of the International Commission of the Rhine. M. Cels, deputy from the Department of Lot and Geronne, at present assistant secretary of state at the Ministry of Public Works, will probably succeed M. Claveille at the head of this Ministry.

It is known that the Treaty of Peace stipulates that the Mannheim Agreement of October 17, 1868, will continue to regulate the navigation on the Rhine. Within six months of the date upon which the treaty goes into effect, a central commission will convene for the revision of this Mannheim Agreement. Germany has already agreed to abide by the decisions of this commission which will be composed of 19 members—two representatives of each of the following countries: Holland, Switzerland, Great Britain, Italy and Belgium; four for the German States on the river and four for France which will, moreover, name the president of the Commission.

The duty of this Commission will be to assure the freedom of navigation on the Rhine which will become an international river. It will also control the execution by Germany of the handing over of the tugs and boats, as well as its installations, in the Port of Rotterdam.

France alone, may take from the Rhine the water required for the operation of its lateral canals. That country will have an exclusive right to the power produced by the river.

M. Claveille has prepared a vast project to make the most of these advantages granted France by the Treaty, either by the use of the navigable waters of the Rhine for importing



Mogul Locomotive Built for the Danish State Railways by the Baldwin Locomotive Works.

This is one of an order for 16. The locomotive is built for standard gage, has 460 mm. by 610 mm. cylinders, a total weight in working order, engine only, of 44,630 kgs.; a weight on drivers of 36,470 kgs., and is superheated. It burns coal and is intended for freight service.

and exporting between Basle and Rotterdam, or by the creation, along the river, of large hydro-electric plants to furnish electric power for the whole Parisian Region, thus doubling the producing capacity almost without expense.

Woolwich Arsenal to Manufacture

Railway Rolling Stock

Lloyd George, Prime Minister of Great Britain, recently visited the Woolwich Arsenal in order to make himself acquainted with the view of the men on the question of discharges and to inspect certain parts of the works which are now being used for civil work. During the war about 110,000 men were employed and the number has now been reduced to 30,000. One of the main points of the men's case is that there are thousands of men who are skilled at their own particular work in the Arsenal but who, if they were discharged, would have to face the labor market as practically unskilled men. By utilizing their labor in the Arsenal in other directions, such as in the work of repairing railway wagons, locomotives, etc., these men would be doing useful work and at the same time their presence in the Arsenal would be a kind of war insurance. In the event of emergency they could be readily turned on to the special munition work in which they are skilled.

This plant has, since the armistice, turned out 10,000 milk churns, freight car repair work is in progress, orders have been received for 2,500 new railway freight cars and one hundred 100-ton standard gage locomotives. The Prime Minister informed the committee that Woolwich is to be developed for the manufacture of locomotives and cars.

Sale of Railway Material by British Government

Among war material offered for sale by the British Government were the following:

Locomotives.

Six 0-6-0 type, 4-ft. 8½-in. gage, by Kerr, Stuart & Co. Cylinders 17-in. by 24-in. stroke.
 A number 0-4-0 type, 4-ft. 8½-in. gage, by Baldwin Locomotive Co. Cylinders 16-in. by 24-in. stroke.
 A number 0-6-0 type, 4-ft. 8½-in. gage, by Baldwin Locomotive Co. Cylinders 16-in. by 24-in. stroke.
 A number 0-6-0 type, 4-ft. 8½-in. gage, by Manning, Wardle & Co. Cylinders 12-in. by 18-in. stroke.
 A number 0-4-0 type, 4-ft. 8½-in. gage. Cylinders from 8-in. diameter to 12-in. diameter with stroke from 8-in. to 24-in.
 Two 1 side tank and one saddle tank, rebuilt by J. Wake, of Darlington. 3-ft. 6-in. gage.
 18 side tank engines, 2-ft. 6-in. gage, built by Hunslet Engine Co., Leeds. Cylinders 9½-in. by 12-in. stroke.
 One 2-6-2 type, 2-ft. 6-in. gage, by the Yorkshire Engineering Co. Cylinders 6-in. diameter by 14-in. stroke.
 Three 0-4-2 type, 2-ft. gage, by Kerr, Stuart & Co. Cylinders 8-in. by 12-in. stroke.
 Two 0-4-0 type, 2-ft. gage, by Kerr, Stuart & Co. Cylinders 5-in. by 9-in. stroke.
 Three 0-4-0 type, 2-ft. gage, by R. Hudson & Co. Cylinders 6-in. by 9-in. stroke.
 One 0-4-0 type, 2-ft. gage, by Avonside Engineering Co. Cylinders 8-in. by 12-in. stroke.
 A number of 0-4-0 type, 60 c/m gage, by W. G. Bagnall. Cylinders 6-in. by 9-in. stroke.
 A number of 4-6-0 type, 60 c/m gage, by Hunslet Engineering Co. Cylinders 9½-in. by 12-in. stroke.
 A number of 4-6-0 type, 60 c/m gage, by Baldwin Locomotive Co. Cylinders 9-in. by 12-in. stroke.
 Two 2-6-2 type, 60 c/m gage, by American Locomotive Co. Cylinders 9-in. by 14-in. stroke.
 One 0-4-0 type, 1 ft. 8-in. gage, by W. G. Bagnall. Cylinders 5-in. by 7½-in. stroke.
 Wagons.
 Four-wheeled open wagons, 60 c/m gage. Weight 1,868 lbs. Loose sides and ends.
 Four-wheeled open wagons, 60 c/m gage. Weight 2,016 lb. Folding sides and ends.
 Bogie low-sided wagons with falling doors, 60 c/m gage. Weight 5,040 lbs.
 Bogie tank wagons without tanks, 60 c/m gage. Capacity 1,500 gal.
 Four-wheeled light ration wagons with falling sides, 6 ft. 8 in. long by 4 ft. 10 in. wide.
 Spare wheels and axles with roller bearings for tip wagons.
 Spare parts for all above mentioned rolling stock.
 40 4-ft. 8½-in. gage covered vans.
 80 3-ft. gage timber frames and sheet-iron lined side tip wagons, 1½ cubic yards capacity.
 16 flat-topped 3-ft. gage timber framed bogies.
 Track.
 10,025 tons of rails, 75-lb., F/B., B.S.S.
 650 tons Fishplates, 75-lb., F/B., B.S.S.
 202 tons Fishbolts, 75-lb., F/B., B.S.S.

Equipment and Supplies

Locomotive Deliveries

The following locomotives were shipped during the week ended December 6:

Works	Road	No.	Type	Individual engine No.
American...	T. & P.	2	Pacific	709-10
		2		
Baldwin....	B. & O.	7	U. S. R. A. Mall.	7153-59
	P. & R.	6	U. S. R. A. Consol.	1689-94
	L. V.	1	Santa Fe	4066
		14		
Total.....		16		

Locomotive Shipments in November

The Railroad Administration has issued the following statement of locomotives shipped in November:

Road	On order prior to Federal control	U.S.R.A. Orders	Constructed in Railroad shops	Total Builders
Type	No.	Type	No.	Type No.
B. & O.	U.S.R.A. Mallet..	88	8	Baldwin
C. C. & O.	U.S.R.A. Mallet..	1	1	Baldwin
L. V.	Santa Fe	3	3	Baldwin
Mo. Pac.	U.S.R.A. Mount.	2	2	American
N. & W.	Mallet	1	1	Baldwin
P. R. R.			8	Penn. R.R.
P. L. W.	Santa Fe	2	2	Baldwin
P. & R.	U.S.R.A. Consol.	13	13	Baldwin
Sou. Pac.			1	So. Pac.
Sou. Pac.			1	So. Pac.
Total.....	6	24	10	40

Freight Cars

THE SINCLAIR REFINING COMPANY, Chicago, is inquiring for three dump cars.

FREDERICK W. GLARDON, 165 Broadway, New York, is inquiring for one 30,000-gal. tank car for export.

THE STERLING COAL COMPANY, Philadelphia, Pa., has ordered 100 mine cars from the Pressed Steel Car Company.

THE BAGDAD LUMBER COMPANY, Bagdad, Fla., has ordered 40 steel logging cars from the American Car & Foundry Company.

THE JAMISON COAL & COKE COMPANY, Greensburg, Pa., has ordered 180 mine cars from the American Car & Foundry Company.

THE GREENLEAF-JOHNSON LUMBER COMPANY, Norfolk, Va., has ordered 15 15-ton logging cars from the American Car & Foundry Company.

THE EASTERN STEEL COMPANY, Pottsville, Pa., has ordered five 50-ton steel gondolas and 17 50-ton steel hopper cars from the American Car & Foundry Company.

Machinery and Tools

THE GREENVILLE STEEL CAR COMPANY, Greenville, Pa., is inquiring for tool equipment for an additional machine shop which it contemplates building at Greenville.

COMITY BETWEEN COMPETITORS.—Erie Railroad commuters yesterday told a story of an obliging engineer who stopped their train to give away hot water. At Heller Field, the eastern landing field of the aerial mail service on the West Orange (New Jersey) branch, Pilot P. W. Smith was ready to start with the Chicago mail when it was discovered that the water pipes at the field were frozen and there was not enough hot water on hand to start his motor. As the train came in sight, someone flagged the train, and told the engineer of the pilot's trouble. "Glad to help you out," said the engineer. Two fifty-gallon tanks were rolled up the railroad embankment and the obliging engineer filled both with hot water.—*New York Times*.

Supply Trade News

The Van Dorn Girder Plate Company, manufacturer of railway car appliances, has removed its general offices from 2325 South Paulina street, Chicago, to 608 South Dearborn street.

The United States Railway Supply Company has been incorporated at Mobile, Ala., with a capital of \$100,000, by J. M. Walsh and George L. Kilmer, of Mobile, and George L. Morton, of Atlanta, Ga.

The Mid-Continent Equipment & Machinery Company has been organized at St. Louis, Mo., to deal in railway supplies. F. W. Glauser is president, R. H. Wilson, vice-president, and J. B. Fidler is secretary-treasurer. The offices of the new company will be in the Security building.

J. M. Fitzgerald has disposed of his interests in the Alger Supply Company, Chicago, dealers in railway supplies and concrete products, to his former partner, O. S. Flath, and the latter has incorporated the O. S. Flath Company, Inc., retaining the same offices in the Peoples' Gas building.

Herbert S. Crocker and Francis S. Crowell, civil engineers, have associated under the firm name of Crocker & Crowell with offices at 101 Park avenue, New York City, to engage in the design and supervision of industrial and engineering projects and the investigation of engineering features of proposed investments. They will also act as owners' representatives in the administration of contract work let on a percentage basis.

D. L. Eubank has been appointed district manager in charge of the Cincinnati office of the Galena-Signal Oil Company. Mr. Eubank was born November 24, 1869, and was in the employ of the Chesapeake & Ohio from September, 1889, to February 1911, as locomotive fireman, locomotive engineer and road foreman of engines. In February, 1911, Mr. Eubank accepted a position as mechanical expert with the Galena-Signal Oil Company.

Lester W. Collins, recently refrigeration technologist for the United States Department of Agriculture in charge of the development of a standard heater car for the Refrigerator Car Committee appointed by the United States Railroad Administration, has been appointed chief engineer of the Refrigerator Heater & Ventilator Car Company, St. Paul, Minn., with office in that city. For seven years prior to his government service Mr. Collins was assistant to the engineer of tests on the Atchison, Topeka & Santa Fe.

The Chicago Pneumatic Tool Company reports, for October, an influx of orders in excess of the record of any previous month since the armistice. The same is true of the company's English and German subsidiaries. Following this country's entrance into the war the German subsidiary was seized by the German government and has been run under "compulsory administration," but that administration has now been abolished and the management is being transferred back to the company through the courts of commerce.

The Sinclair Refining Company, Chicago, has organized an asphalt sales department at its Chicago office to handle the output of the Meraux (La.) refinery, formerly owned and operated by the Freeport & Michigan Fuel Oil Corporation. E. F. Fitzpatrick, assistant sales manager of the general oil section of the Sinclair Refining Company, has been appointed manager of the new department. J. M. Woodruff, general manager of the Southern Asphalt Association, Atlanta, Ga., and formerly manager of the paving and publicity departments of the Standard Asphalt & Refining Company, has been appointed assistant manager. The headquarters of the department will be in the Conway building.

Railway Financial News

AUGUSTA SOUTHERN.—See Georgia & Florida.

BALTIMORE & OHIO.—The directors have declared the usual semi-annual dividend of 2 per cent on the preferred stock.

BOSTON & MAINE.—A special meeting of the stockholders has been called for December 23 to authorize the issuance of bonds to the amount of \$2,273,000, to be secured by the company's present mortgage with the Old Colony Trust Company and another as trustees, dated December 1, 1919.

The proceeds of the issue will be used solely in taking up the 6 per cent bonds issued to the director general of railroads. Stockholders will also be called upon to authorize an issue of \$10,000,000 bonds, the proceeds to be used in paying the government money expended for improvements and additions, and an issue of \$620,000 bonds, the proceeds to be used for the purpose of paying notes of the Boston & Lowell Railroad.

Stockholders will be asked to amend the by-laws of the company to the effect that the directors may provide for the election by their board or appointment by the president of five or more of their members to constitute an executive committee which may exercise all powers of the board of directors in the management of the business, and that the president of the railroad shall act as chairman of this executive committee.

CHESAPEAKE & OHIO.—H. E. Huntington has been elected chairman of the board of directors to succeed Frank Trumbull, resigned. Mr. Trumbull will continue as a director and a member of the executive committee of both the Chesapeake & Ohio and the Hocking Valley companies.

GEORGIA & FLORIDA.—Judge Hammond of the Richmond County Superior Court of Georgia has ordered the sale of this road on Tuesday, February 3, 1920. The sale will include the Augusta Southern Railway, which is owned by the Georgia & Florida.

LONDON MOTOR BUS STOPS.—In spite of the arduous nature of their work, the number of involuntary stops made by motor buses on the London streets during the last twelve months works out at the extremely low figure of one stop for every 10,000 miles run.

THE SWITCHMAN AS "SALESMAN."—How can a switchman become a good salesman? . . . When the yardmaster gives you work to do get it done and when you have completed the job report to him for another one. If you happen to be working on a lead keep the engine moving. Don't think that you can stay down in the track thirty minutes each time you go after a "cut" and be a good salesman. You are "skinning" the buyer. Better be honest and have the good will of the yardmaster, because you cannot tell when you will need his help. One night I was the direct cause of a passenger train "side swiping" some cars. Fortunately the accident caused but little damage and delay. The damage amounted to about \$500. I fully realize what \$500 means to the average man and that a few \$500 credit on his bank book would put him on "Easy Street," yet it doesn't take much of a wreck to cost your employer \$500. I fully realized the seriousness of my position and I fully expected to be discharged. I knew that the accident was caused by misjudgment and not by gross carelessness, but how was I to convince my employer? I wasn't discharged. I had always sold my yardmaster the best I had and he showed his appreciation by fighting for me. He was so successful in his fight for me that I did not lose a minute's time. It was some time before I found out why I wasn't discharged and I can assure you that I resolved more than ever to be a better switchman. You often hear of cases like this and you wonder, "How he got by with it." Put in a good line in place of the stuff you are selling the yardmaster and he will help you as he did me.—Duit Wright.

Railway Officers

Railroad Administration

Operating

C. A. Turney has been appointed trainmaster of the Northern division of the Chicago, Milwaukee & St. Paul at Milwaukee, Wis., succeeding **A. Mallum**, assigned to other duties.

C. L. Wilson, trainmaster of the Western division of the Toledo & Ohio Central at Columbus, Ohio, has been appointed to the newly created position of superintendent of terminals at Toledo, Ohio; **Harry M. Rittenhouse**, trainmaster of the Kanawha & Michigan at Charleston, W. Va., has been appointed Mr. Wilson's successor. **Ira B. Chadwick**, assistant superintendent at Bucyrus, Ohio, has been transferred to Columbus.

Traffic

James Cameron has been appointed chief of the tariff bureau of the Grand Trunk, Western Lines, with headquarters at Chicago, Ill., succeeding **S. L. Strauss**, notice of whose death appears in this issue.

J. M. Wooddall has been appointed assistant general passenger agent of the Georgia at Atlanta, Ga.; **F. L. Nelson** has been appointed passenger service agent and **E. O. Pritchard** freight service agent, also at Atlanta.

Engineering and Rolling Stock

P. G. Winter has been appointed mechanical valuation engineer of the Chicago, Milwaukee & St. Paul at Chicago, succeeding **W. F. Lynaugh**, assigned to other duties.

S. E. Mueller, general foreman in the locomotive department of the Chicago, Rock Island & Pacific, at Cedar Rapids, Iowa, has been promoted to master mechanic of the Dakota division, at Estherville, Iowa, succeeding **R. J. McQuade**, who has resigned.

R. C. Bennett, master mechanic of the Pennsylvania at Pittsburgh, has been appointed superintendent of motive power, Eastern Pennsylvania division, succeeding **E. W. Smith**, notice of whose transfer appeared in the *Railway Age* of October 10 (page 764). **F. S. Robbins** has been appointed Mr. Bennett's successor.

Corporate

Executive, Financial, Legal and Accounting

J. H. Hustis, receiver for the Boston & Maine, has been elected president of the newly organized company. **Woodward Hudson**, president during the period of Railroad Administration, has been elected vice-president and general counsel. Both will have their headquarters in Boston.

John Leistad, of Atlantic, Iowa, has been elected vice-president of the Atlantic Northern, with headquarters at Atlantic, and **Bertel Christensen**, of the same city, has been elected treasurer. The elections were to positions which have been vacant since the government took control of the roads. A refinancing fund of \$110,000 has been raised, saving the road from receivership. **S. C. Pederson**, Kimballton (Iowa) banker, has again been chosen president of the road, and **C. E. Spar** been re-elected secretary, general manager, auditor and general freight agent.

Operating

G. G. Dodge, freight claim agent of the United Railways of Havana, has been appointed assistant to **E. M. Wise**, general manager of the Guantanamo & Western, at Guantanamo, Cuba.

Traffic

J. A. Simmons, general freight agent of the Cincinnati, Indianapolis & Western, with headquarters at Indianapolis, Ind., has been appointed general traffic manager of the Cincinnati, Indianapolis & Western Railroad Company, with the same headquarters, the position he held prior to government control.

Obituary

Sidney L. Strauss, chief of the tariff Bureau of the Grand Trunk, Western Lines, with headquarters at Chicago, died on December 8, in that city.

Joseph M. Denyven, general freight agent of the Mobile & Ohio, died suddenly of apoplexy, December 18, at his office in the Fullerton building, St. Louis, Mo.

John H. McEwen, auditor of disbursements of the Nashville, Chattanooga & St. Louis, died at his home in Nashville Aug. 27. Mr. McEwen was born in Nashville in 1862 and educated in the public schools of that city. He began railroad work in 1895 as clerk in the car accountant's office of the Nashville, Chattanooga & St. Louis, where he remained until 1897 when he became clerk in the disbursement office of the same road. In September, 1900, he was appointed auditor of disbursements, the position he held at the time of his death.



John H. McEwen

Garret Iseman is reported dead at Sparkhill, N. Y., at the age of 95. Mr. Iseman was a locomotive engineman on the Erie Railroad as far back as 1847, and continued in that service for about 40 years. As a boy he was engaged with the workmen who laid the track of the Erie Railroad in the region of Piermont, about 1836.

Col. Henry W. Hodge, consulting bridge engineer, died at his home in New York, on December 21. Col. Hodge was born in Washington, D. C., on April 14, 1865, and was graduated from the Rensselaer Polytechnic Institute in 1885. He began his engineering work in the engineering department of the Chesapeake & Ohio and entered the employ of the Phoenix Bridge Company as assistant engineer. In 1893 he began practice as an independent engineer. In 1895 he entered the employ of Alfred P. Boller, becoming a partner to Mr. Boller in 1899, under the firm name of Boller & Hodge, which lately became the firm of Boller, Hodge & Baird. Among some of the railroad bridges which he designed and built were the Great Northern bridge at St. Louis, Mo., the Chicago, Rock Island & Pacific bridge at Duluth, Minn., the bridge of the Choctaw, Oklahoma & Gulf, now part of the Chicago, Rock Island & Pacific, the cantilever bridges of the Wabash-Pittsburgh Terminal Company at Pittsburgh, Pa., and Steubenville, the Pecos Valley viaduct of the Southern Pacific, the Harlem river 4-track drawbridge of the New York Central and all the structures on the National Railroads of Mexico. Col. Hodge also was retained by the Canadian Government as a consulting engineer on the Quebec bridge. In 1916 he was appointed Public Service Commissioner of the first district of New York, from which position he resigned in July, 1917, to go to France on the request of General Pershing, being commissioned Major in the Engineering Corps; later Lieutenant-Colonel and then Colonel. Col. Hodge was attached to General Pershing's staff in France as Director of Military Railroads and Bridges.

